#### NORTH QUEENSLAND NATURALIST

34.41

Nos. 141-162

OCT. 1966-DEC. 1973

L H Moon & Son Bookbinders





# THE 21 NOV 1966 NORTH QUEENSLAND NATURALIST CAIRNS

JOURNAL OF

#### NORTH QUEENSLAND NATURALIST CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The Furtherance of the Study of the various branches of Natural History and the Preservation of Our Heritage of Indigenous Fauna and Flora.

ADDRESS - Box 991, P.O., CAIRNS. North Queensland, Australia.

Subscriptions (Due September 30):
City and Suburban Members, \$2.50. Country Members, \$2.00

Junior Members, 50c.

141.

| Vol. 34         | OCTOBER 1966  | No                         |
|-----------------|---------------|----------------------------|
|                 | CONTENTS      |                            |
| Some Bird Notes | a Crebriflora | 1<br>1<br>2<br>3<br>6<br>7 |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers - September 30, 1966 to September 30, 1967
President: A. J. CASSELS, Esq.
Hon. Secretary: Mrs. M. L. CASSELS Hon. Treasurer: Mrs. M. MEARS,
Editor: Miss J. MORRIS

#### CLUB HANDBOOKS

| Check List of North Queensland Orchids     | 75c |
|--|-----|
| Check List of North Queensland Ferns       | 10c |
| Edible Plants in North Queensland          | 20c |
| List of Birds Occuring in North Queensland | 20c |
| Marketable Fish of the Cairns Sea          | 10c |
| Check List of Australian Dryopidae         | 5c  |
| (Plus Postage)                             |     |

#### Some Bird Notes

Several reports confirm that the English house sparrow is now established over a wide area of North Queensland. Round about December, 1965, single birds, pairs, and parties of up to 15 or more were seen at Redlynch and North Cairns, at Babinda, Mareeba and even in the dry sparsely settled Mt. Carbine district. During January a party of up to 6 sparrows breakfasted daily for more than a fortnight on seed of a casuarina tree at Edge Hill, pecking the seeds from the cones on the tree. Since then, in this garden, sparrows have been seen only occasionally.

Mr. Ben Constable reports: "The red-breasted welcome swallow has a habit of flying around at night. At Babinda and Cairns I have seen them repeatedly flying around the lights and catching insects up till very late at night. They are not birds that have been disturbed from their roost, but are definitely feeding on the insects attracted by the light."

A further note from Mr. Constable compares the masked plovers' manner of feeding with that of the gulls, when they flutter their feet in the puddles of muddy water on the mud flats to make the small marine life come to the surface for more oxygen. The plover takes "two paces forward and tap, tap, tap, with one foot - this is usually followed by a quick grab at some insect. ... The plover disturbs (the insects) in some way by this foot-tapping and is right there with the ready bill when they move."

#### THE LITTLE NATIVE BEE

In 1937 a mate and I were chasing gold out on Oakey Creek, twenty-odd miles south of Maytown. We had a bough shed built for our dining room, and a table made from a sheet of bark. The little native bees were plentiful around our table all day so, as the weather was cool, we put some clean frying fat out for them every day on two tin lids on the table.

One morning I was cooking a batch of bread in the camp-oven and the be were very thick, each flying off with two little balls of fat. My mate and I we writing letters on our bark table and we happened to notice that one bee had only one large black leg - the leg on which they pack the ball of pollen or fat on whatever they are collecting. Now of course this bee became the centre of in terest. Would it put a double issue on the one leg, or would it just take the or ball of fat? The bee put the usual sized ball of fat on the one leg and rolled up another the same size and carried it in its mouth.'

Stanley H. Boyd.

#### **EDITORIAL**

Almost five months have passed since our last Journal appeared - extremely busy and somewhat worrying months for the Club's officers and active members. However, well-attended meetings and field days have been thoroughly enjoyed. Outstanding among the illustrated talks presented at meetings were those by Mr. Len Brass, describing his work as botanist with the Archbold Expeditions to New Guinea, and by Mr. Charles Tanner, discussing reptiles and particularly the wide colour variations which occur within species of snakes. In addition, a more specialized but much appreciated lecture was given us by Dr. Scholander, leader of the "Alpha Helix" scientific research team, his special study being the Mangrove. Field days have ranged from dry mineral areas, to rain forest, to sea coast. At each, one or two native trees have been planted an infinitesimal gesture in Nature's vastness, but worthwhile nevertheless. Annual Meeting. At the Annual Meeting in September, all office bearers were The President took heart from the fact that town membership has re-elected. increased, and from these town members future officers must come. Country membership has fallen slightly as the Club's financial position has made it necessary to inquire after some long overdue subscriptions. Further, it has been reluctantly decided that the Country Members' Subscription should be increased from \$1.50 to \$2. Here it may be explained that from the regular annual subscriptions of all members, our Club's ordinary running costs are met, the Journal and other Club publications are printed, and postage is paid to maintain contact with country members and to send the Journal (either free or on an exchange basis) to many other Clubs. Universities and Institutes in Australia and The fledgling University of Papua-New Guinea library is now added overseas. to this list.

Orchid Check List. Our revised Check List of N. Q. Orchids has been highly commended by botanists and orchid specialists. It is selling well, and in time the cost of its printing (\$182) may be recouped - allowing more frequent issue

of the Journal.'

Flecker Herbarium Appeal. No satisfactory outcome has yet resulted from approaches made to Lands Department and other authorities to secure a piece of land on which to build a permanent home for the Flecker Herbarium. However the Committee has been encouraged by the evident appreciation shown of the value to Cairns of this fine collection of N. Q. plants. Negotiations and fundraising efforts will continue. For a full account of donations received and of the functions held to date, see supplementary sheet. The Committee's sincere thanks go to all who have contributed in any way, while the hope is expressed that a great deal more support is yet to come. It is certainly needed.'

Send for your decorative Wildlife Car Transfer. This will identify you to fellow naturalists anywhere in Australia.

Price: 20cents, plus postage.

#### Page 3 NORTH QUEENSLAND NATURALIST

THE IMPORTANCE OF TYLOPHORA CREBRIFLORA,
A REPRESENTATIVE OF THE NORTH QUEENSLAND FLORA

By E.Gellert and R.Rudzats,
Department of Chemistry,
Wollongong University College,
The University of New South Wales,
Wollongong, N.S.W.

Poisonous plants have always been of vital interest to primary producers, it is therefore not surprising to find that State and Commonwealth gazettes have devoted considerable space to reports of this nature. The initial effort of investigating plants poisonous to stock culminated, at the end of the 1939-45 war, in the establishment of a Phytochemical Survey of Australian Plants, i.e. the commencement in this country of the methodical investigation of plant products and the exploration in more or less detail of the physiological activity attributed to different species. The credit for this important development is primarily due to Drs.L.J.Webb and J.R.Price, both of C.S.I.R.O.

The flora of Queensland is of special interest as it is one of the best sources of tropical and sub-tropical vegetation in Australia. This flora has provided probably the largest portion of Australian plant material for chemical and pharmacological investigation.

As we are mainly interested in the alkaloidal content of plants we investigated some of the plant species in the families of Lauraceae and Asclepiadaceae; e.g. the genus Cryptocarya, resp. the genus Tylophora. The alkaloids present in Cryptocarya species vary greatly in their chemical structures. Among them the highly toxic and vesicant alkaloid, cryptopleurine, is probably the most interesting. The elucidation of the structure of this alkaloid as a phenanthroquinolizidine derivative opened the way to the elucidation by Indian chemists of the structures of tylophorine and related alkaloids from T.asthmatica, showing that they structurally belong to the related phenanthroindolizidine group of compounds. The structural similarity of cryptopleurine with the latter alkaloids and the claims associated with their use in India as drugs prompted us to investigate some species of the genus Tylophora present in Australia.

The pharmacological activity of plants of the Asclepiadaceae family was ascribed by early investigators mainly to non-alkaloidal material, e.g. saponins and cardiac glycosides, as only some of the genera contained alkaloids. Maiden (1) was probably the first who drew attention to the possibility that Australian Tylophora species might contain alkaloids similar to those isolated from the same genus elsewhere. In fact, the Australian Phytochemical Survey of Queensland Plants (2) reported the presence of alkaloids in several species.

Our invectigation centred on Tocrebriflora S.T.Blake, designated originally as Tofloribunda Bent. The change of the botanical name was due to the previous assignment of the latter name to a different Japanese species. The original botanical description was made on the basis of a specimen found at Mt.Warning, however Tocrebriflora has since been found at several locations in North Queensland, the most important source being the Atherton Tableland. Our sample for the initial investigation was collected at Wongabel. The plant is a slender vine (Figure 1) which most often trails along the ground though semetimes it climbs shrubs or even small trees. The lower part of the stem is corky and broken parts of the fresh material exude (W.T.Jones, personal communication) a mustard coloured latex which affects the eyes and has a burning effect on contact with the skin. The leaves, which are variable in shape (from oblongcordate to ovatecordate) and in size (7-12 cm long and 2-10 cm wide), are green on top and paler underneath.



Figure 1. Tylophora crebriflora vine (air-dried)

During the original investigation of <u>T.crebriflora</u> we isolated two alkaloids: tylophorine, which was identical with one of the alkaloids obtained from <u>T.asthmatica</u>, and tylocrebrine,  $C_{24}^{H}_{27}^{NO}_{4}$ , a new phenanthro-indolizidine alkaloid. We also suspected the presence of several more alkaloids which might be isolated from extraction of larger plant samples. This assumption has since been verified by Dr.V.Rao in the U.S.A. We expected that in comparison with similar compounds the physiological activity of tylocrebrine would show diminished toxicity and enhanced antitumour activity due to the differences in chemical structure. Our findings appear to bear out this hypothesis.

Tylocrebrine (Figure 2) was submitted for an exhaustive preclinical testing schedule to the Cancer Chemotherapy National Service Center of The National Institutes of Health in the United States of America. The results obtained against the L1210 lymphoid leukaemia test system indicated a very significant increase in survival time of mice (3). These experiments were then followed up by further preclinical toxicological and pharmacological tests in other systems, in other animals, and in tissue cultures, eventually reaching the stage of clinical trials in cooperating U.S. hospitals on human sufferers.

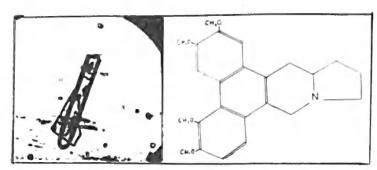


Figure 2. Left: Crystals of tylocrebrine. Magnification 600%.
Right: Structure of tylocrebrine.

As yet no final evaluation could be made concerning the therapeutic value of tylocrebrine, therefore the drug cannot be released for general use at this stage. We hope however that tylocrebrine will soon be available as a drug to fight leukaemia. If so, then one rather rare member of the North Queensland flora will be credited with a major contribution towards solving the problem of cancer. Consequently, the likelihood of obtaining new drugs with activity of this type from Australian plant material establishes, apart from any other considerations, the importance of preservation of the native flora for chemical and pharmacological investigation.

#### References:

- (1) MAIDEN, J.H. Australasian Assoc.for Adv. Science 6, 37 (1895)
- (2) WEBB, L.J. a, Guide to the Medicinal and Poisonous Plants of Queensland. C.S.I.R. Bull.No.232 (1948)
  - b, Australian Phytochemical Survey.

    Part I, C.S.I.R.O.Bull. No.241 (1949)

    Part II, C.S.I.R.O.Bull. No.268 (1952)
- (3) GELLERT, E. and RUDZATS, R. J.Med.Chem. 7, 361 (1964).

#### Disembowelled Toads Near Water

The Toad, Bufo marinus, introduced into Queensland in the 1930's to help combat the cane beetle, has now extended his range down the eastern seaboard of Australia and, in N. Q. at least, inland over the Dividing Range. This rapid spread was due principally to the fact that Bufo is armed with poison glands which protect him from predators. With this immunity from attack plus a high reproduction rate, he is ousting native toads and frogs, thus upsetting the balance of nature, and bids fair to become one of our major pests.

It is interesting to note, therefore, that he has at least one natural enemy in this country. I have often found dead bodies of Bufo close to water and always mutilated in the same manner: i. e. by the belly being opened and the intestines partly removed. Clearly whatever killed and disembowelled Bufo was after the contents of the stomach or perhaps certain of the organs for food and, as this always happens near water, suspicion falls on the water rat.

This suspicion is supported by the fact that my wife has several times recovered long defunct bodies of Bufo from the "innards" of our washing machine which we afterwards found was the home of a white tailed rat - presumably a water rat. The water rat has a white or partly white tail, and our non-paying boarder was known to bath in the residual water of the washing machine reservoir and obviously took the toads in with him. So it is a fair assumption to say that the Whitetailed Water Rat is the killer.

However, this is conjecture and I would like to receive more information on the subject. If verified it would show again how Nature is always striving to maintain a balance and I suppose given enough time, Bufo would eventually be brought under control.

#### A. J. Cassels.

#### Observation by J. James at Tinaroo Creek, Feb., 1966.

Rat with white-tipped tail, thick fur, about the size of a domestic rat, head much shorter and "blunter" (nose not elongated), four chisel teeth in front.

This rat was seen to bite a piece out of the underside of a toad and to place portion of the toad's insides in its mouth with its front paws. James killed this rat, then dissected the toad with pocket knife to discover that heart and liver only had been removed.

The rat, although white tailed, did not conform to the usual white tailed rat in general appearance. As this specimen was male, James was unable to determine if it were marsupial.

This observation could explain the common sight of freshly disembowelled toads near water.

#### NATURE NOTES FROM THE PENINSULA

The year 1902 was a drought year up in Cape York Peninsula. On Merluna, the station where I was working, the Chinesegardenerhad an acre of bananas grow ing. The wallabies jumped the fence at night to get something green, and in a few nights they stripped every stalk, then ate the centres down to ground level, and they chewed down into the stumps as far as their thin snouts would reach. Of course they always got away before daybreak. These hollowed out stumps each held an eggcup full of water and, as the lagoon from which we drew our household supplies went dry, the wallabies came round during the night to drink. We, meanwhile, had to pack and cart water on a sleigh from lagoons a mile away.

It was the custom of a flock of Squatter Pigeons to walk between the station buildings on their way to the lagoon for their daily drink. They were never molested, and continued their gentle "coo-coo" as they walked down to drink. Squatter pigeons always walk to water from their feeding ground, but once they have had their fill, they fly up and around into a dead tree. Later, after taking observations, they plane down to commence feeding, and preening their feathers. This flock of pigeons located the banana stumps and every day they were able to get a drink of juice as clear as rain water, until the storm rains came along and relieved the situation for all.

Stanley H. Boyd.

#### SNAKE SERVICE

#### SNAKE SERVICE

In November last year a picnic party spent the day at Double Bridge on the Black Mountain road near Kuranda. During the morning the children spied a snake curled round a high tree and slowly making its way up towards a clump of ferns growing on a branch near the top. It crawled round and round the tree making little headway on the rough bark. Later the party heard a crash and found that the snake had fallen, either accidentally or on purpose, to a much lower tree. It then crawled across to the near branch of another tree and so drew near ground level. One of the party brought it over and it proved to be a carpet snake 7 feet long and about 7 inches in girth. Its markings were very bright and fresh and the snake was so docile one wondered if it had just shed its skin or was sick. Here another member of the party leaned over and picked out three scrub ticks whichwere embedded in the scales of the snake near its mouth. The snake was then placed gently on the ground and it slowly glided away, this time by-passing the tree, and headed down the grassy slope to the creek.

Irene Mears.

N811

# THE NORTH QUEENSLAND NATURALIST

CAIRNS



#### NORTH QUEENSLAND NATURALIST CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The Furtherance of the Study of the various branches of Natural History and the Preservation of Our Heritage of Indigenous Fauna and Flora.

ADDRESS - Box 991, P.O., CAIRNS. North Queensland, Australia.

Subscriptions (Due September 30):
City and Suburban Members, \$2.50. Country Members, \$2.00

Junior Members, 50c.

CONTENTS.

Club Handbcok 2
Editorial 2
Insects Attacking Grevillea spp. in the Mareeba Area 3
Edge Hill Quarry 6
Hector, the Spider 8
"The Loss of a Tree" 8
The Bower Bird 8

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers - September 30, 1966 to September 30, 1967
President: A. J. CASSELS, Esq.
Hon. Secretary: Mrs. M. L. CASSELS Hon. Treasurer: Mrs. M. MEARS.

Editor: Miss J. MORRIS

#### CLUB HANDBOOKS

| Check List of North Queensland Orchids     |     | 75c |
|--|-----|-----|
| Check List of North Queensland Ferns       | •   | 10c |
| Edible Plants in North Queensland          |     | 20c |
| List of Birds Occuring in North Queensland |     |     |
| Marketable Fish of the Cairns Sea          |     |     |
| Check List of Australian Dryopidae         | • • | 5c  |
| (Plus Postage)                             |     |     |

#### EDITORIAL

We are happy to report that a home has been found for the Flecker Herbarium. Not a specious one admittedly, but it has taken away the worry of where it was to be housed when we vacated our present premises. It would appear that this will be in the near future.

Mr. V. Winkel, Curator of Parks and Gardens of Cairns, is very interested in the Herbarium and at his instigation, the Club wrote and asked the Cairns City Council for permission to use a small building originally built for this purpose, in the Council Gardens at Edge Hill. Mr. Winkel also put in his request to the Council and permission has been granted. However, some repairs, renovations and additions will probably be necessary and it is proposed, with the consent of the members, to use the money collected for the Building Fund to this end. Any money left over after these have been completed will be used for the running of the Herbarium.

We would remind all members and readers that at any time this Herbarium is open for inspection and study purposes by interested people when they visit Cairns. All they need to do is to get in touch with the President, Mr. A. J. Cassels or Curator, Dr. L. Brass at Box 991, Cairns.

#### Donations to Herbarium Building Fund — Continued.

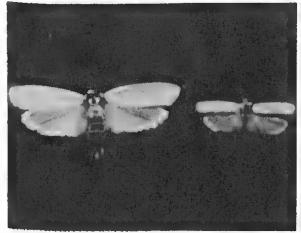
Mr. V. Reilly, Mr. J. Crowhurst, Mr. R. Taylor, Mr. and Mrs. Lovett, Mr. S. Dean, Mr. P. Colman, Miss Taylor. — Total \$246.84.

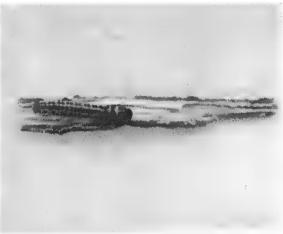
We congratulate Mr. A. Dockrill on his appointment to the Lae Herbarium.

## INSECTS ATTACKING GREVILLEA spp. IN THE MAREEBA AREA

By K. H. HALFPAPP — Box 60, Mareeba.

During the past year observations were made on insects attacking Grevillea spp. in the Mareeba area. The insects listed have not been observed on all the Grevillea spp. common to this area. Each insect species is listed with its known hosts.





Xylorycta homoleura Low, Xyloryotidae (female and male moth).

Larvae of Xylorycta homocleura found mining Gr. mimoisides.

Xylorycta homoleura Low family.

#### Xyloryctidae

Larvae of the above species mine the stems and branches of G. pteridifolia and G. mimosoides emerging at night and dragging the leaves to the entrance for food. The adult moths are white of medium size with broad wings with medium scale fringes. Male moths are smaller than the females and can be distinguished by a light brown stripe on the posterior margin of the fore wings. These moths are generally retiring in habit though attracted to light.

'The larvae are light green in general body colour with dark sclerotised plates over the body surface. The head capsule is particularly dark and heavily sclerotised.

The entrance to the larval mine is protected from the outside environment by a large chamber composed of silken threads covered on the external surface by fras pellets.

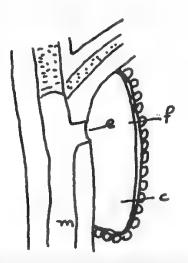
Pupation occurs in the larvae shelters, the pupal case remaining after emergence of the adult.

Moths being observed in this study emerged in October.



Cornutipoides tricornis Evens.





c chamber
f (ras
entrance to mine
m mine

Entrance to mine at Xylorycta homoleura mining G. mimoisides.

Another insect found in great abundance on many Grevillea spp. is Cornutipoides tricornis Evans family Eury melidae.

Both adults and nymphs of this species are found on the tender young stems and shoots. They are active creatures when disturbed having the habit of moving quickly round the stem so as to keep the trunk between them and the intruder. Only occasionally do they take flight.

They are dark brown in general body colour with ochrous patches on the tegmen, legs pale or dark brown. Ventral surface of the abdomen pale brown. The head bears three horns, the frons being produced into an upward turned horn slightly paler than the downward and inward projecting horns on the vertex closely associated with eyes.

These insects produce a honey dew which attracts the following species of ants. Iridomyrmex rufoniger Lowne, a small black species with a strong tapinoma odour. Iridomyrmex detectus Sm the mound ant. This is about 8 mm long purplish brown in colour with a red head, strong tapinoma odour and bites savagely. Iridomyrmex. sp. specific name not known, a pale brown ant the same size as I. rufoniger and Leptomyrmex sp. slender ants which carry the gaster turned up over the back of the thorax. Head and thorax red, abdomen purplish brown. Length 7-8 mm.

The presence of C. tricornis is often betrayed by the large number of ants farming the honey dew. At no time during this study were these leaf hoppers observed without attendant ants. Attempts to rear the leaf hoppers without the ants failed.



Iridomyrmex rufoniger, formidae attending C. tricornis on Gr. pteridifolia.

Quite often where C. tricornis are found in great abundance on Grevillae spp., a black sooty mould growing on the excess honey dew secreted covers the leaves and stem.

To date C. tricornis has been found breeding on the following Grevillea spp. in Mareeba. G. pteridifolia, G. parallela, G. mimosoides and G. glauca.

Another leaf hopper of the family Membracidae occurs on the tender shoots of G. pteridifolia. This insect has a strongly developed pronotum which is produced backwards over the body to conceal the scutellum. Pronotum dark brown, tegmen hyaline, legs brown closely pressed to the body. Ventral surface of abdomen dark brown. Genus and species unknown.

These are active insects occuring singularly as distinct from C. tricornis.

#### EDGE HILL QUARRY

The rocks of the Edge Hill Quarry are sedimentary and apparently are some of the oldest rocks in the Cairns area.

Radio activity tests of rocks acquired from a wide survey of all Australian land surfaces indicate that there are no rocks on the Eastern part of the Continent that are of greater age than four hundred million years, save the various bodies of rocks represented in the Mount Isa and Broken Hill series. This puts a time limit of that age or less on the Edge Hill Quarry rocks. The finding of a trilobite in those rocks appears to confirm the findings of the radio activity tests, placing them in either the Late Cambrian or early Ordovician geologic eras.

Fossils that can be identified definitely are commonly used by geologists as time-markers in rocks and this has given rise to the whole study of Palaeontology, which amounts to the recognition, classification and placing in their proper age groups those fossils which are more plentiful and easily recognised in given land areas. It is found that throughout the world fossils of a given geologic era are very closely similar, even to being identical in character. Hence a trilobite that occurs in rocks in North Queensland can be accepted as being of the same age as that same kind of trilobite found in England or in America. This finding has greatly simplified the task of the geologist in placing fossil-bearing rocks in their proper ages.

At times a well-known fossil is found in rocks but is very scarce in those rocks in which it is found. This does give rise to technical problems at times but mostly it is found that some simple explanation offers. The scarcity of trilobites in the Edge Hill Quarry is a problem that seems fairly easily answered.

Trilobites were not deep-sea organisms. They preferred what are called the Littoral, or long-shore waters; shallows, tidal reaches. For this reason they are usually found associated with the coarser sediments such as sands and gravels. They did occur where there were boulders and pebbles but these do not seem to have the same protective action toward buried organisms that finer-grained sediments have.

Even the fine-grained sediments are to be graded in a comparative sense. Sands are common along the littoral. They are found in the greatest deeps of the sea but not as a usual thing. Out in those areas the great percentage of the sea-floor sediments is of ooze, a fine-grained sediment that is composed chiefly of silt, the finest of rock dust and detritus that is carried by water. Winter floods carry the rough, unsorted assembly of sediments down the rivers to the sea but, once there, the great body of sea water has a sorting effect and the coarser sediments are deposited at once, the sands and gravels further out. The silts are drifted for many miles out to sea, sometimes being caught in ocean currents and carried to the great deeps. suspension in the sea for many days they reach the sea floor and form finegrained sedimentary beds such as those of which the Edge Hill Quarry is composed. It is understandable that any dead organisms that the waters carried along with the sediments are deposited on the sea floor a very long time before the silts sink down there, hence their great scarcity in the finegrained, deep-water sedimentary beds. Hence the scarcity of fossils at Edge Hill.

In the quarry mentioned the beds are standing up on end. This is a feature common in many of the more ancient rocks and is due to earth movement, the up-raising of mountains, the shearing of great fault movements and the tearing apart of rock formations due to volcanic upheaval.

In Cairns area there has been wast amount of earth-movement and changes of geologic formation are frequent and what one might term drastic within comparatively small areas. The rock series can, however, be roughly classed into four main movements.

First geologic structures in the were the sedimentary rocks, of late Cambrian to early Ordovician age. These were thrown into twisted and broken contours by the intrusion of the dark rocks, ferro-magnesians that grade from basalts through a diorite-Andesite complex to Gabbros, according to their average crystal sizes. These rocks were rich in iron, the green, ferrous state predominating, also in lime magnesia and soda, together with many of the trace elements necessary to plant growth. These rocks decompose to form the rich soils so noticeable in the areas surrounding Cairns.

Following the dark rocks came light-coloured rocks of a granitic complex. These threw both the sedimentary rocks and the dark rocks into a tumbled confusion, crushing them into disorderly mustus in which schists and basic gneisses are common. Included in these are rocks of a dark colour that are, further south, given the rough classification of Brisbane Schists.

The granitic complex extruded many heated solutions that passed along the shear and shattered zones of the dark rocks and sedimentary masses. These are visible quartz veins in many places on the faces of dark rock exposures. These veins in some cases contained gold, wolfram and other valuable materials. Passage of these substances is found to be roughly on temperature basis, so that the cooler solutions flow further away from their genetive origin, cooling as they go. For this reason the gold and wolfram, both of which emanate at high temperatures, are found commonly to have ploved furthest away from the granitic mass that first brought them in. Wolfram usually is deposited mineral at a temperature of fifteen to twenty degrees centigrade. Tin, on the other hand, and accompanying tourmaline, tantalite and muscovite, are commonly deposited at a temperature of five hundred degrees centigrade or near it. Hence the rich tin veins are found in the granitic complex rather than removed from it.

The big granite domes found around the North Queensland region are the commonest locations of vein tin and it is from these that the alluvial tin has been removed by erosion and concentrated in the beds of nearby streams and rivers. Hot tin-bearing solutions rise to the tops of the granite domes while they are at great depths in the ground, commonly called Plutonic Depths, and as the great earth-movements grow quiet that first gave rise to the formation of granite domes, the whole system of mineralisation comes to a standstill, leaving the various minor systems of mineralisation undergoing no further change.

The dark rock material that first broke up the Edge Hill sediments has intruded them in various places and these intrusions are still visible in situ though the series has been stood on end, dark rocks and all. They form very useful key to the age-succession revealed in the quarry.

Following all the previous rock depositions and formations, of course, came the violent upheavals of the volcanoes, of which there are many right along the eastern seaboard of Australia save for the Blue Mountains region of sedimentary rocks. In the areas embracing all the heavy-rainfall regions of Cairns, Mackay and Cooktown, the volcanic movements occurred in the dark rocks most commonly. This has resulted in a lot of the volcanic material retaining the rich, fertile nature of the diorite complex from which volcanic explosions removed it.

#### HECTOR, THE SPIDER

Hector, the spider used to spin every night about 7, in the open kitchen window. Each morning the web was gone — he must have had Arab blood in him! We threw him bits of meat about "O" size. First he sat in the middle of his web, gathered up the strands with his feet and shook the whole web quite violently to see if the "intruder" would fall off. Then he would go down and get them. Once I threw a bit of match wood to see what he would do. He went to it and not only got it free of the web but he held it out in space a little before letting it go — I presume to stop it catching again lower down! We learnt that the radiating lines of web we could gently stroke with a finger tip and not stick to them, but the others were very sticky and could not be played with. We were sad when, one night, a storm swept our pet away.

LORNA HARRISON, Brisbane.

#### "THE LOSS OF A TREE"

"As I passed by I looked and saw what YOU had done. You had cut it a foot above the ground. All around lay the chunks of its white flesh, spattered from the axe. It fell so easily. It did not fight back at all. Its pride and majesty were so easily humbled, flung at your feet, a wreckage of broken branches and mangled leaves. Did you see the long shudder before its fall, I wonder? Did you hear the sigh of the leaves, the wrenching cry as it strained, then crashed before you?

"It exists no longer. But all around it, in the earth and in the air, war has been declared against you. The air for your breathing is less sweet than before. The birds have forsaken you, leaving the insect pests and rodents to their work of destruction. The wind will batter you more harshly. The rain will belt the earth more piteously, its fall unbroken by that leafy screen. The unanchored soil will be stolen away by the rivulets of wasted water..—That tree did not fight back, but its friends will fight for it. And long after the needless felling of the tree has been forgotten, their revenge will continue...."

—Lines from an unknown author, contributed by courtesy of the Queensland "Save the Trees Campaign" to the Queensland Forest Service Pamphlet No. 4, "Valuable Queensland Timbers".

"He that planteth a tree is the servant of God; he provideth a kindness for many generations, and faces that he hath not seen shall bless him".

- HENRY VAN DYKE.

#### THE BOWER BIRD

Chasing the elusive metal up at Wenlock on the Batavia River in 1940, I camped in a bark humpy built by prospectors a few years previously. As usual, pawpaw trees had been planted, and when I arrived there the tree was loaded with fruit. Near this tree a very large anvil had been set on a large stump — it must have been left there in old bullock wagon times. Here I sharpened my picks and steel, and the two kerosene tins of water for tempering meant 8 gallons of water for the pawpaws every time.

Two Bower birds built a nest close to my hut, and they also had a large bower in a nice sheltered spot. Every working day the bower birds visited my claim at lunch time. Of course I had a pawpaw for my dessert whenever I could, and I always left fruit on the skin for the birds. They were very careful and each time one set off for the nest, it carried three pieces of fruit from the point of the beak back to the throat. I know that, early in breeding, this pair did have three chicks, but I never thought to take a peep when they were taking the three pieces away from my dinner at the claim.

STAN BOYD, Cooktown.

574

NSIL

# THE NORTH QUEENSLAND NATURALIST

#### CAIRNS

#### Journal of

#### NORTH QUEENSLAND NATURALIST CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS — The Furtherance of the Study of the various branches of Natural History and the Preservation of Our Heritage of Indigenous Fauna and Flora.

ADDRESS — Box 991, P.O. CAIRNS. North Queensland, Q. 4870, Australia.

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00.

Junior Members, 50c.

| Vol. 34.                |             | JULY   | , 1967. | •      |      |      | ]    | No. 14: | 3. |
|-------------------------|-------------|--------|---------|--------|------|------|------|---------|----|
|                         |             | CONTE  | ENTS.   |        |      |      |      |         |    |
| Club Handbooks          |             | ****   | ****    |        |      |      | **** | ****    | 2  |
| Editorial               |             | ****   |         |        |      |      |      |         | 2  |
| Mimicry                 | ****        |        |         |        | **** | 4    |      |         | 2  |
| Bufo marinus Eaten b    |             |        |         |        | **** | **** |      |         | 5  |
| Birds of Hunter's Creek | k, Julatten | North  | ı Que   | enslan | d    | **** |      |         | 6  |
| On Collection of Alphe  | id Shrimp   | from C | Queen   | sland  | **** | **** | **** | ****    | 7  |
| Michaelmas Cay          |             |        | ****    |        | **** | **** |      |         | 8  |
| A Twilight Supper       | **** . **** | ****   | ***     | ****   | ***  | **** | **** | ****    | 8  |

<sup>&</sup>quot;Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers — September 30, 1966 to September 30, 1967.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mrs. M. MEARS.

Editor: Miss J. MORRIS.

#### CLUB HANDBOOKS.

| Check List of North Queensland Orchids     | **** |      | **** |         |      | 75c |
|--|------|------|------|---------|------|-----|
| Check List of North Queensland Ferns       |      | **** |      |         |      | 10c |
| Edible Plants in North Queensland          |      | **** | **** | ****    | **** | 20c |
| List of Birds Occuring in North Queensland |      | ***  |      |         |      | 20c |
| Marketable Fish of the Cairns Sea          |      |      | **** |         | **** | 10c |
| Check List of Australian Dryopidae         |      | **** |      | * * * * |      | 5c  |
| (Plus Postage)                             | ).   |      |      |         |      |     |

#### EDITORIAL.

Club members are pleased with our new meeting place at Oddfellows Hall, Lake Street, opposite the Fire Station. We hope that any Country members in town on meeting night will be able to find it without difficulty.

Wide public interest was shown in the Club's exhibit of "Dangerous Plants of Cairns District" at the Cairns Show. Dr. L. J. Brass is to be commended on this well thought out and excellently arranged display, which served to warn people of potentially dangerous plants both in garden and bush, besides drawing attention to our Club.

The active participation of more families and young people in Club field days and meetings is most welcome.

Members' subscriptions are due again in September — also, too soon!

#### MIMICRY.

#### Mimicry is one of the most fascinating aspects of the battle for survival.

Some butterflies have in their bodies distastful or, even, poisonous substances, formed in the course of the ordinary metabolism of the larva, or derived from its food. Such butterflies are, usually, left alone by predators which learn to recognise them very quickly, after only one or two trials.

Most of these protected Lepidoptera have bright colours and bold patterns which make them conspicuous. Their behaviour does the same. Both appearance and behaviour function as a definite warning that they are inedible. The most outstanding feature is the small number of different colour patterns which they show. If we compare a great number of specimens of protected species we would see the same colour pattern repeated over and over again by the representatives of widely different genera and families. The conclusion is inevitable that members of a great many groups, which we would expect to look very different from each other, have converged to a relatively few simple

colour patterns. Conversely, the closely related species, which should

be quite similar, often look entirely different.

This mutual resemblance of protected species, independent of relationship, is called "Muellerian" mimicry, after a German entomologist Fritz Mueller, who pointed it out. Briefly, it amounts to this: protected (inedible) species, by mimicking each other, tend toward proup uniformity of appearance, showing only a few warning patterns, instead of many.

The chief value of this type of mimicry lies in its simplifying the learning process for the predator. To learn hundreds of different patterns not only would be beyond the mental capacity of the average predator but, as they learn by the trial, would cost too many lives.

Muellerian mimicry offers the only possible explanation of the otherwise inexplicable similarities and dissimilarities of tropical Lepidoptera.

The chief protected groups are: widespread Danaidae; Acraeidae, an essentially African family with a few representatives in Indo-Malayan region: Heliconiidae, Ithomiidae and Dismorphinae (a sub-family of Pieridae) confined to 5th America; Aristolochia eating Papilios of Amer-

ica and Indo-Malaya; and some day-flying moths.

In regions where hundreds of protected forms fly in relative security we also find some perfectly edible species mimicking the inedible ones and enjoying the same immunity. They mimic not only the colour but, also, behaviour and manner of flight. Sometimes both sexes are mimics but, mostly, only the females which are more important for the preservation of the species than a mere male. There is another reason, however: bluff which is too frequent defeats its own end. If insectivorous birds learn that a large percentage of butterflies with warning coloration are good to eat — the warning ceases to be effective.

The simpliest and most convincing explanation of such mimicry has been given by Alfred Wallace: "the number of species of insects is so great, and there is such diversity of form and proportion in every group, that the chances of an accidental approximation in size, form, and colour of one insect to another of a different group is considerable; and it is these chance approximations that furnish the basis of mimicry, to be continually advanced and perfected by the survival of those varieties

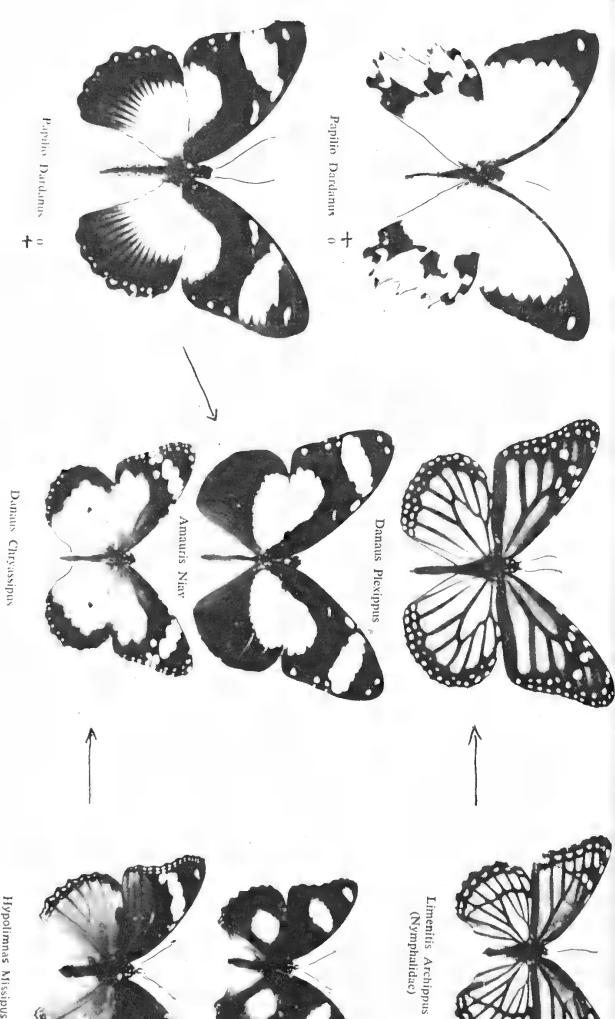
only which tend in the right direction".

This type of mimicry is called "Batesian" after the famous British nat-

uralist Henry Walter Bates.

The most striking example of Batesian mimicry is given by the common African Swallowtail, Papilio Dardanus. In Madagascar, where predators are few, the female has the same normal pattern as the male; on the mainland it's another story; in forest country the female mimics the common black and white Danaid — Amauris Niavus; in open country — the red-brown Danaus Chrysippus. The same "Lesser Wanderer" serves as model to a female of a Nymphalid — Hypolimnas Missipus. Both can be found in Australia. An American Nymphalid, Limenitis Archippus, both sexes alike, mimics the ubiquitous Wanderer, Danaus Plexippus.

Sometimes the roles are reversed. In New Guinea Papilio Laglaizei mimics a day-flying moth — Alcidis Agathrysus, while in Korea, the



Hypolimnas Missipus (Nymphalidae)

day-flying moth, Epicopea Mencia, mimics an Aristolochia feeding Papilio Alcynous. A very curious example is given by the Malayan Papilio Polites: some of the females have normal pattern, but some mimic the poisonous Papilio Aristolochiae; in Singapore, where P.Aristolochia is scarce, only about 50% of females are mimics; elsewhere, where P. Aristolochiae is common — the percentage of mimicking females reaches 85%.

In exactly a hundred years, since Bates read before the Linnean Society his paper, "Insect Fauna of the Amazon Valley", propounding the theory of mimicry, quite a lot of mimicking species have been found. Curiously, only three families: Papilionidae, Pieridae, and Nymphalidae are mimics; none have been found among the remaining families.

References:

- 1. Alexander B. Clots, "The World of Butterflies and Moths".
- 2. R. Morrell, "Malayan Butterflies".

E. SKREEN, P.O. Box 9, Bondi

#### Bufo marinus Eaten by Rattus rattus.

This incident was observed at Hambledon Raw Sugar Mill, Cairns in the last week of May 1967. The mill weighbridge was checked by the Government Department, and was rechecked eight days later, and the weighbridge found insensitive. Examination showed a rats' nest and several partly eaten toad corpses in the weighing mechanism beneath the weigher dial, six feet above the weighbridge pit floor. Poison was laid and two rats were obtained. These were identified by Mr. J. H. Buzacott, Manager of Meringa Sugar Experimental Station, as being Rattus rattus.

A few days later the same incident occurred, and more Bufo marinus corpses were found stacked on the mechanism ledges, but no nest. A further Rattus rattus was found dead.

The weighbridge pit could only be entered by a rat by a 3" drainage pipe from an adjoining pit, which could be entered by a small steel staircase. The Bufo marinus corpses were found in the weigher mechanism six feet above the pit level, with only small apertures for the connecting rod mechanism. No toad could have got there by itself.

The toad corpses were eaten as follows: eyes, stomach and portions of the back legs. The poisonous neck glands were not touched. The white tailed rat around swamps, according to Mr. Buzacott, has been known to eat the stomachs only. Mr. Buzacott stated this was the first observation of Rattus rattus eating Bufo marinus. Whether the three rats died of eating some portions of the poisonous skin of these toads or the poison set is unknown. One could surmise that the rats were beseiged in the pits by factory cats and have eaten any toads which jumped into the first pit and could not escape. These toads were dragged into the weighbridge pit via the small drainage pipe and eaten as available food, in a position where the cats could not follow, near their nest.

N. G. K. ADAMS.

### BIRDS OF HUNTER'S CREEK, JULATTEN, NORTH QUEENSLAND.

A small stream, Hunter's Creek, rises on Mt. Lewis and flows between Julatten and Mt. Molloy, probably into Rifle Creek and thence to the Mitchell River. It was in this area on the banks of the creek that we camped, two adults and five children, for a weekend during mid-October 1965, a stones throw from the main road. It looked a good birding spot as it was on the fringe of the Mt. Lewis rain forest and the open eucalypt country typical of Mt. Molloy and it contained also some grass savannah and last but not least a two acre lily lagoon—Abattoir swamp — or more appropriately Lake Jacana. The area fulfilled its promise well as my wife and I recorded 83 bird species (4 heard) in 1½ days and within ¼ of a mile of our camp.

A new one to us, the Noisy Pitta, was located in a small copse only 75 yards from the tent whilst closer still were both Boat Billed and Pied Flycatchers, a pair of Long Tailed Nightjars and of course many others.

It is worth listing separately the birds on Lake Jacana itself. Firstly Jacana (or Lotus bird) were very numerous and an estimate of 100, I am sure would not be an exaggeration. Others included Green Pygmy Geese, Jabiru, plenty of Eastern Swamp Hens, a lone Pied Goose, Black and White Eyed Ducks, Australian Snipe, Darter, Royal and Yellow Billed Spoonbills, Masked Plover, Little Grebe, Sandpipers and various Egrets and Cormorants.

In addition we visited a small swamp behind Mt. Molloy some three or four miles away and recorded 16 species there, which included Glossy Ibis. Of course many we had already seen on Lake Jacana.

We were fortunate to meet Mr. Kevin Gadd on whose property most of these birds were seen and it is a pleasure to record that he is an ardent conservationist and quite willing to permit bird observers on his land providing all property rights are respected and cattle are not unduly disturbed. He mentioned that fruit pigeons were numerous along the creek in November and December so these alone should be worth a special visit. At one time 3 Pied Geese were on the Lake, but one morning when he visited the Lake, two had been shot by "Sportsmen".

It is worth mentioning that the Lake has been filmed and photographed by Mr. Vincent Serventy and Mr. Graham Pizzey and no doubt has been shown on TV and in the nature magazines.

Finally the children in addition to swimming (br.r.r.r.r.) in the creek were able to identify 6 species of small fish and these together with some mammals heard throughout the night plus sundry snakes and lizards and a lovely climate makes this an ideal camp spot for all who can still take pleasure in Nature's wonders.

### ON COLLECTION OF ALPHEID SHRIMP FROM QUEENSLAND.

During 1960-1961 while a Fulbright Research Scholar and Guggenheim Fellow in the Zoology Department of the University of Queensland (Anonymous, 1960), and a guest of the Heron Island Research Station of the Great Barrier Reef Committee, I made a number of collections of pistol or snapping shrimp (Alpheidae) at sites along the Queensland Coast. My field of study has for many years included biological sources of underwater sound, and my modest collections were made for purposes of later identification of alpheid sound sources, the identifications to become part of the data accompanying tape recordings of underwater sound.

For the information of carcinologists, my alpheid collections have been deposited in the United States National Museum through the good offices of Dr. Fenner A. Chace, Jr., Senior Scientist in the Department of Zoology, to whom I am much indebted for criticism of my tentative identifications and of the collections generally. The materials have received the following accession numbers: 232608 and 235498 (Moreton Bay); 233127 and 234240 (Capricorn Islands); and 234692 (Port Curtis).

One interesting association, called to my attention by Dr. Fenner A. Chace, Jr., of the Smithsonian Institution, is that between an alpheid of the Capricorn Islands (Nos. 233127, 234240), thus far unidentified, and the bristle-worm **Eurythoe complanata**, four pairs of the shrimp having been collected and so labelled, each pair hovering over one of the worms beneath a coral bombie on Heron Island Reef or on Wistaria Reef. On October 21, 1960 I was injured extensively on the right hand while collecting this shrimp on the Heron Island Reef by the barbed, fluid-containing spines of the bristle-worm. I avoided the blistering recently described for this injury (Yaldwyn, 1965) by at once immobilizing the injured hand so the spines would not break and then bathing the hand in vinegar soon after injury until the calcareous spines were completely disolved and the irritation ceased. It seems likely that any mild acid, such as that from a cut citrus fruit, might serve the same purpose.

J. M. MOULTON

Department of Biology, Bowdoin College, Brunswick, Maine, U.S.A.

#### References:

Yaldwyn, J. C. (1965): Aust. Nat. Hist., 15: 86. Anonymous (1960): Aust. J. Sci., 23: 157.

#### MICHAELMAS CAY.

This small cay about eight acres in size is famous as the breeding ground of many sea birds. On a visit on October 1st, 1965, between 10 - 20,000 Sooty Terns were found in all stages of nesting. This was the only bird with eggs and small young, though the Common Noddy Tern also had already nested and the young were on the wing. Lesser Crested Terns and Crested Terns seemed as though ready to nest, being seen among the nesting birds. It was obvious that the Sooties were in discrete parties, some which had nested earliest having flying young while others had small young, some were incubating eggs and some were new arrivals. The groups seemed to number about 500 birds and since arrivals take place regularly an observer coming a few months later might find an entirely different picture as regards numbers. About 20 Silver Gulls were working the colony of Sooties and on my disturbing the birds by my arrival immediately destroyed a number of eggs. This is inevitable on such islands but fortunately Sooty Terns will lay again when their egg is destroyed. No attacks on chicks were seen and in general there were remarkably few dead birds.

No landing was made on Upolu Cay but it was populated by about 1000 Sooties, no doubt in much the same stage of nesting as at Michael-V. SERVENTY.

mas.

A Twilight Supper.

During the dry season, the job of an Aboriginal stockman and myself was to keep a check on three windmills erected on three, once flowing bores, with twenty thousand gallon tank and the necessary troughing

for cattle and horses to drink at.

As the sun was getting low in the evening there was a large sheen on the top of the twenty thousand gallon tank. This attracted many birds before they retired, and a few mud hornets and bees were busy. Now twilight was setting in and only a light sheen remained on the water. Lots of mosquitoes and small moths and other night fliers came out, and now the bats were appearing from every angle. Business was brisk, thirty or more bats darting and criss-crossing just a few inches over the water, all so busy and hungry. We just stood and watched. Then all at once in came two night hawks.\* My native boy prodded me to watch the hawks carefully. "He like kiki (to eat) bats", he said. Those two night birds selected branches 20 to 30 feet high on trees each side of the tank, and every now and then one darted down and across and up onto the branch on the other side. And when we heard a light clap, we knew the hawk had got a bat, then we saw it eating the catch on the branch of the tree. In three quarters of an hour or less, darkness had set in, there was no more sheen on the water, and all insects and bats had dispersed, likewise the night hawks.

Each night we camped near those tanks, which was often, we saw

the same show, until the storm rains set in.

STANLEY H. BOYD.

<sup>\*</sup> Presumably some species of owl. Ed.

G. K. Bolton, Printers, 54-56 Grafton St., Cairns.

# THE NORTH QUEENSLAND NATURALIST

#### CAIRNS

Journal of

#### NORTH QUEENSLAND NATURALIST CLUB

#### Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Junior Members, 50c

Vol. 34.

Country Members, \$2.00.

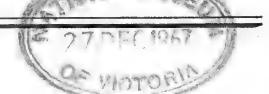
// //

No. 143. /44

#### CONTENTS.

| Club Handbook   | 2 |
|---|---|
| Editorial   | 2 |
| Nature's Weather Prophets, Vincent M. Reilly                          | 3 |
| The Loner, Mrs. Hayward, Brisbane                                     | 3 |
| Sea Eagles on the Reef, Bob Moncrieff, Toowoomba                      | 4 |
| Life History & Parasites of the Moth, Hypsa Alciphron - N. C. Coleman | 5 |
| Notaden melanoscaphus- Michael J. Tyler                               | 7 |
| The Bat Hawks - A. L. Rand  | 8 |

"Each Author is responsible for the opinions and facts expressed in his or her article".



Club Officers - September 30, 1967 to September 30, 1968
President: A. J. CASSELS, Esq.
Hon. Secretary: Mrs. M. L. CASSELS Hon. Treasurer: Mrs. M. MEARS.
Editor: Miss J. MORRIS

#### CLUB HANDBOOKS

| Check List of North Queensland Orchids         |
|--|
| Check List of North Queensland Ferns 100       |
| Edible Plants in North Queensland              |
| List of Birds Occuring in North Queensland 200 |
| Marketable Fish of the Cairns Sea              |
| Check List of Australian Dryopidae 50          |
| (Plus Postage)                                 |

#### EDITORIAL

It is pleasing to know that the Mayor of Cairns, Ald. Colin Penridge, has agreed to become Patron of our Club.

The Flecker Herbarium and Club Library have now been safely installed in the building provided by the Cairns City Council at the Botanical Gardens in Edge Hill, Essential furniture and equipment for this building have been provided from our now much improved funds. Here the Honorary Curator, Dr Brass, can now work, and will welcome interested visitors.

When possible, requests for specimens (beetles for a young entomologist in Hungary frogs for the University of Queensland, etc.) have been met.

In short, those most active in the Club may look back on a year of sound achievement and of much enjoyment.

Christmas greetings and good wishes to all.

NOTE: Townsville University College would welcome, for study purposes, the bones (particularly skulls) of native mammals found in the bush. Ants will clean a "high" specimen. Freshly road-killed specimens, if not too mutilated, are also of value if they can be preserved (preferably in formalin – make slit in belly to allow preservative to enter body cavity.) and send to: Mr. Norman Milward, Dept. Zoology, University College of Townsville, Pimlico, Townsville.

#### NATURE'S WEATHER PROPHETS

One wonders, after studying insects and other animals over a period of years, are they better weather prophets than humans are?

It is a well known fact that ants will move their eggs and young to higher levels some days before heavy rains arrive. The old bushman would watch the ants and know when rain is due, and the ants were never wrong. Crocodiles are also known to make their nests and lay their eggs before heavy rain. The crocodile at Mt. St. John Zoo was noted for this and, generally, after the nest-making and the egg-laying, heavy rain fell. Birds also seem to know when rains are due, as their mating and egg-laying and hatching of the young birds coincides with the growth of fresh green grass with its abundance of insects – grasshoppers, caterpillars, worms, etc. – as well as the availability of fresh water.

Another very interesting observation has been made by Mr. Peter Mac-

onochie, the Water Officer of the Caims City Council.

Speaking to me just after the recent exceptional floods in Freshwater Creek, where the water supply Intake is situated, Mr. Maconochie said: "I should haveknownwe were going to have a flood because I saw the tortoises all out on the high ground." On three previous occasions he has observed this evacuation of the tortoises in the Gorge a few days prior to heavy rains and floods in the Freshwater Creek area. In the Gorge, during the floods, hugh boulders of tons in weight are washed about like corks and a rortoise would have very little chance of survival. So Nature has given them the power to know when a flood is due, when they will vacate the creek for higher ground till the danger is past.

One wonders how many more of Nature's creatures are endowed with this sixth sense and can successfully foretell the weather.

Vincent M. Reilly.

#### THE LONER

It is not generally known that, in herds of cattle, as in humans, there is occasionally an anti-social type which appears to spend its life wandering aimlessly, never mixing with the other cattle. I saw an example of this while

camping in the Gulf Country in Northern Queensland.

The last glimmer of the setting sun made bright patches here and there on the lake as flights of wild duck settled among the water lilies, noisy flocks of black cockatoos and beautiful grey and pink galahs flew up from the water's edge to roost, or flashed and wheeled in evening flight, and pair of sombre plain turkeys warily came down to drink.

Several mobs of stock followed the well beaten pads to either side of the lake, some moving slowly, others in a hurry to drink. After a few playful

bouts between the youngsters, all settled down quietly for the night.

Suddenly the peaceful harmony of this beautiful spot was disturbed by a long drawn out bellow in the distance, coming closer and closer. Then over the rise he appeared - partly grown Polled Angus bullock. There he stood in a tension of anger and scanned the campers, who were between him and the water. Bellowing in defiance, he pawed the soft creamy dust until his glossy black coat took on a greyish hue.

Still bellowing resentfully, he retreated down the slope and followed another pad around the back of the old battery site to the other side of the lake. Then, after quenching his thirst, he approached the resting stock, but not to rest. He wandered aimlessly backwards and forwards amongst them, as though in quest of something. After several minutes he moved along the lake side to the rest of the stock, where he resumed his restless wandering.

The behaviour of the animal was indeed strange, and appeared to have a disturbing effect on the herd.

Then on again, as if following an invisible guide, he moved away from the lake towards a distant line of timber. The urge to roam was ever there, and the mournful bellowing was faintly heard far into the night, as he travelled further and further away over the ridges, unable to find peace, roaming ever onwards.

Mrs. Hayward, Brisbane

#### SEA EAGLES ON THE REEF

It is a matter for some concern, amongst naturalists, at any rate, that our Australian eagles have never received the recognition they deserve. Slaughter er and abuse are the lot of the noble Wedgetail, and in parts of the Outback a bounty is paid for every one destroyed. The splendid sea eagle of our Queen sland coast is better off in this respect; but whoever heard of an Australian who was proud of his eagle, and sincere enough to say so?

The equivalent of our Sea Eagle is the White-headed or Bald Eagle of Americans have proudly displayed their eagle as a symbol of nationhood, while we have chosen to ignore it.

The Wedgetail and Whistling Eagles are old friends of mine, but the Sea Eaglewas only a passing acquaintance until my visit to the far northernreefs.

While we were lying off Cape Bedford one night, watching the light on Three Isles, a reef away to the nor-nor-east, the skipper informed me that there was sea eagle's nest built midway up the steel structure of the hundred foot light tower. I was anxious to examine the nest, but when we anchored off the cay the following morning, the steel light tower failed to reveal any sign of a nest. We landed in the dinghies, and the first thing I noticed was tyre-tracks in the sand of the cay. I scratched my head as I looked at the tracks, for if anything was out of place on this remote reef of the Barrier it was they. Then I remembered the day in Port Douglas when the lighthouse tender Cape Moreton had anchored off the beach and sent her big "duck" ashore. The same thing had apparently happened here, for those tracks led directly to the foot of the tower. While clearing away undergrowth from the foundations, the maintenance crew had no doubt decided to remove the nest in the tower as well.

A week after this disappointment, I was consoled by finding a nest of my own on Eagle Reef, to the South-west of Lizard Island. It was built on the ground, on a cay which is only a few feet above sea level., composed of hefty sticks and all manner of driftwood, it was a tremendous thing, over seven feet high. Apparently, like the wedgetail, the sea eagle builds on and adds to the old nest every year. There was still fluffy down clinging to the top of the nest, but the fledgling was gone. I am not sure, but I believe the sea eagles rear only one youngster a year. Wedgetails, I know, rear two. I climbed the structure, a miniature tower in itself, and found inside the nest two electric light bulbs, probably discarded by passing vessels, and prubber ball. Sea Eagles live mainly on fish and refuse cast up by the sea, so I can only conclude that these strange objects had attracted the hunting eagles' attention while floating in the water, and been taken to the nest for closer examination. Why they were allowed to remain in the nest after being proved valueless as food, I cannot explain.

While I was rambling over the mighty granite crags on Lizard Island, I watched a sea eagle wheeling high above me in the darkening sky. The eagle has a peculiar, butterfly-like flight, and is a joy to watch. Night was at hand and the eagle and I shared a great and all-pervading loneliness of land and sea and sky. I wondered if this was the same eagle that had built its nest on Eagle Reef and, if so, why had it chosed such wulnerable place when the granite heights of Lizard Island were close at hand. The topmost point of Lizard Island is eleven hundred feet above the sea, yet only a few miles away across the water, nest had been built at sea level.

The only inference I can draw is that Eagle Reef is never visited by man, and the bird has therefore no fear of mankind. Perhaps there is another reason. If so, it is good to know that Nature still has a few secrets left.

Bob Moncrieff, Toowoomba.

### LIFE HISTORY & PARASITES OF THE MOTH, HYPSA ALCIPHRON

This moth lays its eggs in dome-shaped clusters, 9-12 mm. in diameter and 4 mm. deep, on the under surface of young terminal leaves of the cluster fig (Ficus racemosa). The eggs are laid early in the evening and several egg-masses may be laid by one moth. I have counted 60-80 eggs approx. in each group. They are fastened to the leaf and to each other by a sticky substance and covered by scales and fine hairs from the moth's abdomen. They are about  $1\frac{1}{2}$  mm. in diameter and of a pale pearly green tint. Hatching takes from 5-7 days and emergence takes place at night.

Caterpillars are about 4 mm. long on hatching, with a large head and slender body. The colour is: head, reddish brown; body, two parallel white stripes on dorsal surface separated by a central black line. There is Inongitudinal white stripe on either side of body ventral surface. Thorax, greyish black; abdomen, yellow. These colours are maintained throughout the larval stage of the insect.

Feeding commenced immediately, the larvae feeding outward from the egg cluster and eating only the softer parts of the leaf, leaving it like a skeleton of green gauze. It took the young caterpillars about two days to eat this first leaf, after which they scattered to nearby leaves. They fed mainly at night, sheltering by day between or under leaves.

From the time of emergence to about one third of their larval period, the caterpillars seemed to die of a disease in which they were suspended from the leaf by a strand of silk or stretched immobile on the leaf surface. Many of the survivors were eaten by small bronze cuckoos and varied trillers. Mortality from the disease was about 30% of the insects and from the birds probably 50% 60%.

There are at least four moults in the caterpillar state, with no apparent change in instars but the diminished proportion of the head to body size. Larval period is 18-21 days, by which time the caterpillar has grown to 28-33 mm in length and 5-6 mm. in diameter. It then prepares to pupate by drawing the edges of a leaf together and binding them with silk. Pre-pupal stage is 1-2 days and the Pupa is naked within the folded leaf.

The adult insect emerges in 12-14 days.

Males and females are similarly coloured: Head, thorax and abdomen, orange (black spot on each shoulder); eyes, brown. Forewings – brown with white veins, central longitudinal white patch on dorsal surface, small oval patch on ventral, surface. Rear wings – dorsal, fore part white, rear brown; ventral, triangular central white patch, remainder brown. The females are about 64 mm. and the males 56 mm. across the wings.

Many of the mature larvae were found to be parasitised by tachinid flies. On examining some of the caterpillars at different stages of growth, I found that the fly laid its eggs on the dorsal area of the thorax and the maggots, on hatching, entered the caterpillar's body near the point of attachment of the egg. Of the caterpillars examined, approximately 60% were parasitised by the fly and had 1-3 maggots in them. The parasitised larvae prepared for pupation in the same manner as a healthy insect by pulling the leaf edges together and binding with silk, but they did not pupate. Examination with the mic roscope showed the movement of the maggot within its victim, and the movement, shape and transparency of parts of the skin showed the number of maggats present. I have watched through the microscope the twitching of the victim's legs and jaws and the writhings of the still living body in response to the movement of the maggots within, and have seen the large kidney-shaped spiracles on the posterior of the parasite as they were thrust to some break or thin area in the caterpillar's skin through which the maggots evidently drew their air supply. From the time of preparation for pupation, these parasitised larvae lived a maximum of four days. Some were still alive when the maggots ruptured the body wall and emerged to pupate beside the host's remains.

As the maggots emerged and pupated, I placed them in separate jars on cotton wool.

Some of these pupae produced the typical, sombre, grey and black, bristly tachinid flies; but about 50% of those examined produced three species of chalcid wasp, which were parasites of the fly maggots within the caterpillars. Two of these species have been identified by entomologists of the C.S.I.R.O., Canberra; the third species has not been identified.

N.C. Coleman, Edmonton.

Notaden melanoscaphus, a species of frog new to the fauna of Queensland.

When Hosmer (1962) described the leptodactylid frog Notaden melanoscaphus the only material available was a single subadult male collected at Borrol-oola in the Northern Territory. In June 1963 P. Aitken and N.B. Tindale of the South Australian Museum collected five specimens of this species in Queensland. The purpose of this note is to place on record this addition to the Queensland fauna and to briefly supplement the morphological information of the type description.

The specimens were found at Appel Channel, Mornington Island and have been deposited in the South Australian Museum collection where they are catalogued R. 4936. Mornington Island is approximately 200 miles east of the

type locality.

The series has a snout to vent length range of 30.8-33.2 mm. with a mean of 31.6 mm. None are sexually mature and the poor condition of their viscera prevents accurate sex determination. In their gross proportions the specimens conform very closely to the type description. Hosmer gave a figure 0.28 for the tibia length to snout to vent length ratio, whilst in the present specimens the range is 0.27-0.29 and the mean 0.284. Similarly the head width to snout to vent length ratio of 0.28 for the type compares with 0.27-0.30 (mean 0.286). From a comparison of these figures with those provided by Hosmer for 10 specimens of bennetti and 46 N. nichollsi, it would appear that comparison of these standard characteristics will not provide a means for distinguishing the three members of the genus.

The dorsal pattern of pigmentation is similar in that all specimens bear five large dark blotches, which are rendered conspicuous or inconspicuous by differences in the intensity of the background colouration. Each specimen bears the jet black outer metatarsal tubercles which evidently charact-

erise this species, and provide a ready means of identification.

Although the skin of melanoscaphus lacks the prominent tubercles of bennetti, it is nevertheless clearly well endowed with secretory granules, for the dorsal surface of two specimens is covered with a dense film of congealed, creamy secretions.

Reference

Hosmer, William (1962), New Leptodactylid Frog of the Genus

Notaden from Northern Australia.

Amer. Mus. Novit. No. 2077, pp. 1-8.

Michael J. Tyler South Australian Museum, North Terrace, Adelaide, S.A.

574 N 811

September, 18th 1967
A. L. RAND

#### THE BAT HAWKS

Mr. Boyd's record of "night hawks" catching bats about a water tank in Queensland (N. Queensland Naturalist, No.143, (July, 1967), Vol.43, p. 8) reminded Dr. L. J. Brass that when he and I were in South New Guinea, (Oriomo River) just north of Torres Straits, with Archbold Expeditions in January and February, 1934, we glimpsed a bird and heard the sound of its slashing wing beats on a number of occasions in the dusk, a bird we suspected of being the Bat Hawk, Machaerhamphus alcinus, which flies at dusk and by night and catches bats. We never secured a specimen, and the evidence we had was too tenuous to include the species in our scientific reports.

However, the bat hawk is definitely known from New Guinea, having been taken from as far east as the Port Moresby area (Astrolabe Mts.and Laloki River, by Goldie and Alex Morton) and the Kumusi River by Meek. Otherwise, it has a wide distribution westward through the East Indies to Southern Asia, and in Africa, where it lives in both forest and the open woodlands or savannas. The bird is apparently rare throughout its range, as it also seems to be in New Guinea, for I never got a specimen and have only a half dozen New Guinea records from the literature, and strangely, all the records are old. When the New Guinea subspecies, M. a. papuanus Mayr, was described in 1940, it was based on single specimen collected in 1907.

The bat hawk has not been recorded in Australia. But, the water gap of Torres Straits between New Guinea and Australia is relatively narrow. Some birds have crossed it, ranging from the East Indies to New Guinea and Queensland, like the blue breasted pitta; others reach New Guinea but not Australia, like the hombill and the tree swift.

Mr. Boyd's record of "night hawks" catching bats is not detailed enough to know whether it was an owl, as the editor suggests, or possibly a bat hawk. Certainly some of the large owls (ninox) of Australia are known to catch bats on the wing and take them to a perch to eat. But, as the question arises, "was it a bat hawk?" The following brief comments on the identification and habits are provided, abstracted from "Handbook of New Guinea Birds" by A.L. Rand and E.T. Gilliard:

Machaerhamphus alcinus Westerman, Bat Hawk.

Length, 17-20 inches, about the size of a peregrine falcon (Falco peregrinus) and somewhat like it in shape and in flight. Colour, plain blackish brown above and below, but with an incomplete white eye ring and a conspicuous white area on throat and breast. A small crest is present on the back of the head, the gape is very wide, bill short, and the upper mandible very compressed and blade-like at the tip. This last is a unique and very distinctive feature.

The bat hawk seems to pass the day perched in some shady tree. In the twilight it begins to hunt, perching on some exposed perch and circling out for its prey, or flying about with much gliding over rivers, where it seizes bats and small birds such as swifts and swallows, in its talons and gulps them down in flight.





PARAL MUON

# THE NORTH QUEENSLAND NATURALIST

27 MAY 1968

CAIRNS

Journal of

#### NORTH QUEENSLAND NATURALIST CLUB

#### Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

#### Subscriptions (Due September 30):

City and Suburban Members, \$2.50. Country Members, \$2.00.

Junior Members, 50c.

| Vol. 35                                       | APRIL,            | 1968                                  | No.  | 145    |
|---|-------------------|---------------------------------------|------|--------|
|   | CONTEN            | rs.                                   |      | 0      |
| Club Handbook<br>Editorial                    |                   |                                       |      | 2<br>2 |
| Do Sonneratia caseolar                        |                   | occur in Queensland G. J. van Steenis |      | 3      |
| Key to the Species of                         | Sonneratia - C. G |                                       |      | 5      |
| References - C. G. G. J. My child, the Duck-b |                   | Oliver Herford                        |      | 6<br>6 |
| Stop Press!                                   |                   |                                       |      | 6      |
| Some Aspects of Soil F<br>Tableland - Jack    |                   | District and the Ather                | rton | 7      |
| Spring on a N. S. W. W.                       | heat Farm - John  | n Crowhurst                           |      | 8      |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers - September 30, 1967 to September 30, 1968.

President: A. J. C ASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS Hon. Treasurer: Mr. G. AYRES

Editor: Miss J. MORRIS

#### CLUB HANDBOOKS

| Check List of North Queensland Orchids     |       |
|--|-------|
| Check List of North Queensland Ferns       | 10c   |
| Edible Plants in North Queensland          | , 20c |
| List of Birds Occuring in North Queensland |       |
| Marketable Fish of the Cairns Sea          |       |
| Check List of Australian Dryopidae         | . 5c  |
| (Plus Postage)                             |       |

#### EDITORIAL

A sincere apology to readers of this Journal for the error in date and number of our last issue. Title page should have shown:

DECEMBER, 1967. No. 144. Instead it repeated the dateline of previous issue: July, 1967, No. 143. Would all librarians, in particular, please note this correction, and accept our apology for any confusion caused.

Our club has sought affiliation with the Wildlife Preservation Society of Queensland, to try to gain a stronger voice on matters of conservation. Specific cases of exploitation of goannas and of certain protected birds have recently drawn active protests from the Club. At the same time it will add our mite of moral support towards implementing the Society's aim of "an all-embracing defination of 'conservation - the rational management of natural resources of all kinds in the present and future interests of the community as a whole' ". \* Development and Progress need not be the sacred cows, to which all must be blindly, blandly sacrificed, that so many politicians and business and industrial developers seem to suggest.

Just a thought on the "dead" coral of Ellison Reef:, would it not, in course of time, become Ellison Cay or Ellison Island? If so conveniently situated for the mining of lime for agriculture, might it not also be ideally accessible as a study area on the formation of coral islands? With a University College now established in North Queensland, to serve, we hope, many generations to come, such a long-range idea may not be entirely far-fetched, or entirely without benefit.

All contributions received for the Journal have been greatly appreciated. Do please continue to submit your observations, great or small, to provide for the interests of us all.

<sup>\* &</sup>quot;Wildlife in Australia", March, 1968.

## DO SONNERATIA CASEOLARIS AND S. OVATA OCCUR IN QUEENSLAND OR THE NORTHERN TERRITORY?

Among the mangrove trees of Queensland there are two genera of which the species possess spurge-like, erect aerial roots massed below the tree. They belong to very different families, namely to Avicennia of the Verbenaceae and Sonneratia of the Sonneratiaceae. Besides the habit, they have in common that their leaves are opposite, but there the resemblance halts.

Avicennia has mostly hairy leaves, at least underneath, and hairy thyrses, the Sonneratias are entirely glabrous. Avicennia has many-flowered spikes or thyrses of small tubular flowers, open during the day, with 4 stamens, and rather small spindle-shaped, 1-seeded capsules opening with 2 valves emitting the already developed germinated seed.

Sonneratia on the other hand has the flowers single or rarely in threes at the end of the twigs. They are large, with a calyx splitting in 4-8 acute lobes, opening at dusk, being nocturnal. There are very many stamens far exserted like a brush. The flowers emit a rather disagreeable smell and produce copious honey. This attracts honey-suckers (according to Beccari) but surely also bats. The fruit is large, and becomes finally a kind of hard-shelled berry, containing very numerous very small seeds embedded in pulp; it is superior or half-superior and is sustained by the hard, more or less enlarged calyx lobes.

There are in the world five species of Sonneratia (1) of which two are confined to the Indian Ocean shores and Malaya. The three others are found throughout the Malesian archipelago and all three are found on the south coast of New Guinea, also in the Solomons, New Hebrides, and one even in New Caledonia, Micronesia and the Marshalls. 1)

One would suspect that all three were also found either in the mangroves of the Northern Territory or Queensland, at least in the Cape York Peninsula, but this is not so!

With Mr. J. Muller, who has made in Borneo an elaborate study of Sonner-atia, mainly for the purpose of the pollen identity, and who has found in pass-the Brisbane Herbarium and all this except two fragmentary sheets belongs to one species. This is in general accordance with Bentham's Flora Australiensis and Bailey's Flora of Queensland, and with Ewart & Davies' Flora of the Northern Territory.

This one species was by these authors sometimes called S. acida, a synonym S. Caseolaris (L.) Engl., but also sometimes S. alba J. Sm.

However, all this material doubtless belongs to the widest distributed species of all three, ranging from the East Africian coast through the Indian Ocean and Malesia to Micronesia and New Caledonia (3), S. alba J. Sm.

In the latter three islands or island groups occurs only one species, the name S. caseolaris (L.) Engl. (for example Hatheway 827, D. Anderson but they were wrongly identified.

However, not only the names but also the identity seems to be confused in Queensland literature. The one collection quoted by name in Bailey's Queensland Flora p. 679, under S. alba viz. "Johnstone River, Dr. T. L. Bancroft" (BRI 063649), though sterile, is presumably not S. alba, but another species, S. caseolaris. This is corrborated by a second sheet in the Brisbane Herbarium, also from Johnstone River, collected by G. H. Ladbrook, July 1917 (BRI 063648), which, though tragmentary, is accompanied by a loose fruit, which is certainly S. caseolaris.

There is thus a reasonable certainty that there are in Queensland at least two species of Sonneratia. Judging from the proximity of New Guinea, it is likely that S. ovata also occurs in Queensland, though this is on the whole scarcer than the other two.

As all the herbarium material of Queensland is scrappy, as it is in most herbaria, due to the difficulty of drying these rather fleshy plants which disintegrate easily when not rapidly dried or at least killed (by alcohol, formalin, or hot water), it would be certainly worthwhile if eager botanists not afraid of making themselves dirty and being bitten by mosquito es, collect new material.

The most promising place would in first instance be Johnstone River.

Sonneratias occur in tidal forest, along muddy shores, in creeks and estuaries, but also often as rather isolated trees on dead coral reefs covered with some sand or mud, within high tide level.

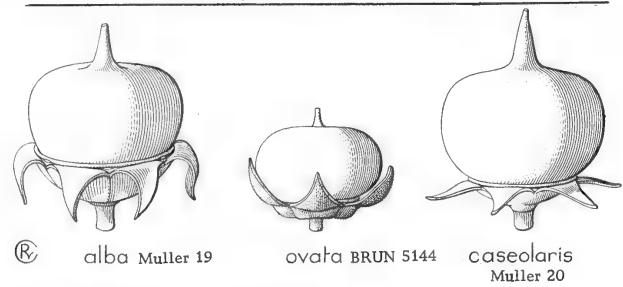
This note is mostly written to encourage the North Queensland botanists to bring more light into the occurrence of Sonneratia in northern Australia. To assist them I have prepared a key with the most essential characters and besides provided figures of the three fruit types, in order to facilitate recognition. It is not impossible that the three species occupy an ecologically slightly different niche and that one is found on, for example, firmer mud than the other, but little is known about this. In habit the tree shape and crown are also very similar, so that one has to get familiar with them by picking specimens either in fruit or in flower, preferably both. Only one of the species, the rarer S. ovata, can more of less be recognized by the leaf-shape being widest near the truncate or even slightly emarginate base.

The structure of the flowers is as decisive as that of the fruit. The calyx tube is either smooth without ribs or lines running; down from the sinuses in S. caseolaris, smooth and with such ribs in S. alba, finely verruculose and with ribs, and with a constriction at the insertion of the calyx lobes, in S. ovata.

Also the petals are decisive; if present they are inplanted between the calyx lobes. In S. caseolaris they are large, wide and blood-red; in S. alba they are white or at base + tinged red, and narrow, sometimes as narrow as a filament; in S. ovata there are no petals.

In the herbarium it is often difficult to find the p etals as they are often early caducous; they can be best observed in mature buds or flowers just opening.

As to the fruits, the differential characters speak for themselves from the figure: in S. alba the fruit is half-inferior, with the sepals recurved in the fully mature fruit, in the other two species the fruit rides more or less on a flat calyx base, the calyx being wide and flat in S. caseolaris and the lobes erect in S. ovata.



#### KEY TO THE SPECIES OF SONNERATIA

1. Petals absent. Calyx finely verruculose, the tube distinctly ribbed and somewhat contracted at the rim, inner side of calyx lobes red. Calyx tube in fruit low (5-10 mm high), the lobes ascending, appressed against the ripe fruit. Leaves broadly rounded or truncate to subemarginate at base, 4-10 by 3-9 cm.

S. ovata Backer

- 1. Petals present, though sometimes narrow. Calyx smooth, its lobes in mature fruit expanded or recurved.
  - Petals linear, 13-20 by  $\frac{1}{2}-1\frac{1}{4}$  mm. white or lower half tinged red. Calyx tube ribbed, inner side of sepals red. Calyx tube in fruit ribbed,  $1\frac{1}{2}-2$  cm high, under the ripe fruit the segments reflexed. Leaves obovate or oval from a cuneate base, c.  $5-12\frac{1}{2}$  by 3-9.

    S. alba J. Sm.
  - 2. Petals linear-lanceolate, dark red (also in dry state) 16-35 by  $1\frac{1}{2}$ - $3\frac{1}{2}$  mm. Calyx tube not ribbed, inner side of sepals greenish or yellowish-white. Calyx tube in fruit flat-expanded, as are the lobes. Leaves lancealate to oval-obovate, the base contracted or cuneate, 5-13 by 2-5 cm (S. acida L. f.)

    S. caseolaris (L.) Engl.

Besides the two poor <u>Sonneratia caseolaris</u> collections, it is surprising that there are, in the Brisbane Herbarium, only four collections of <u>Sonneratia alba</u> from Q ueensland and the Northern Territory. They are the following.:

QUEENSLAND: Cook District; Pt. Douglas Beach, W. T. J. without number; Cooktown, W. E. Roth, dd. 30.6.1899. North Kennedy District: Hinchinbrook I., at Scraggy Point, S. T. Blake 18838.

NORTHERN TERRITORY: Point Stephens, Adam Bay, S. T. Blake 16953.

These localities may yield more species, as the species are often growing in the same mangrove complexes, though in slightly different niches. But there must be many other mangrove patches where Sonneratia has never been collected.

For those botanists or foresters who will respond, I hope, to my plea, I may ask also to be on the look-out for a smallish tree of the inner mangrove, with opposite, simply pinnate leaves which bear underneath in the

axils of the lateral nerves small hair-dots (domatia). This is a Bignoniaceous tree belonging to the genus Dolichandrone, of which three rare endemic in land species are known from the Northern Territory and the Gulf of Carpentaria area (4).

The mangrove specites, however, D. spathacea (L. f.) K. Sch., which is extremely common and widely distributed, from India through Malesia to New Caledonia, has curiously never been found on the Australian continent. Its nocturnal flowers are very long, snow-white tubular trumpets up to 15-20 cm long; the pods are linear, 30-60 cm long, and contain very numerous, unwinged, rectangular, corky seeds which easily float. One would suppose that such a plant, with so-called "obvious, easy means of dispersal", which is common in South New Guinea, must also occur in North Australia

#### REFERENCES:

- Backer, C. A. & van Steenis, C. G. G. J.: 1951, Sonneratiaceae, in (1)Flora Malesiana 4: 280-289.
- Muller, J. & Hou-Liu, S. Y.: 1966, Hybrids and chromosomes in the (2)genus Sonneratia, Blumea 14:337-343.
  Balgooy, M. M. J. van: 1965, Pacific Plant Areas 2, Blumea Suppl.
- (3)5:248, map 137.
- Steenis, C.G.G.J. van: 1929, a revision of the Queensland Bignonia-(4)ceae, Proc. Roy. Soc. Queensland 41:39-58.
- Steenis, C. G. G. J. van: 1963, Pacific Plant Areas 1:248, map 1. (5)

Rijksherbarium, Schelpenkade 6, Leyden, Holland.

C. G. G. J. VAN STEENIS

My child, the Duck-billed Platypus, A sad example sets for us. From him we learn how indecision Of character provokes derision. This vacillating thing, you see, Could not decide which he would be, Fish, flesh, or fowl, and choose all three. The scientists were sorely vexed To classify him; so perplexed Their brains, that they, with rage at bay, Called him a horrid name one day -A name that baffles, frights and shocks us -Ornithorhynchus paradoxus.

Oliver Herford (From an old newspaper cutting, source unknown.)

#### STOP PRESS!

IT IS PLEASING TO NOTE THAT THE GOVERNMENT HAS REFUSED TO GRANT Mr. FORBES PERMISSION TO MINE ELLISON REEF.

## SOME ASPECTS OF SOIL EROSION IN CAIRNS DISTRICT AND THE ATHERTON TABLELAND

On the steep grass-covered slopes of the hills behind Edge Hill surburb of Cairns one can see a number of roughly horizontal and parallel ridges which could be mistaken for animal tracks. These track-like ridges, or slump lines as they are called, occur mainly in heavier rainfall areas where steep slopes have been frequently burned and/or over-grazed. Many examples can be seen on the Atherton Tableland and parts of Cairns District, with particularly clear ones showing on the hills adjacent to the road to Crystal Cascades.

To arrive at the cause of this slumping, one must visualise the early days when most of the Tableland and much of Cairns district were covered in rain forest. Settlers arrived, cleared off forest here and there, established dairy herds or planted crops on the cleared areas. Felling and burning was the easiest way to clear new land, and each year before the "wet" saw fires which burned along the flats and up the slopes, encroaching gradually but surely on the rain forest. Regrowth of trees was impossible as seedlings were destroyed before they had a chance to mature. This, plus increased numbers of grazing stock, eventually denuded the country of most of its trees with the soil-binding properties of their deeply penetrating and intertwining root systems.

This is bad enough on flat land but on the steep slopes damage has been more apparent. Here, the top soil, held together only by shallow-rooting grass, tends to slip downwards when it becomes saturated by rain. Moving perhaps just a little each season the top crust of land forms into myriads of slump lines - or if you like, "wallaby tracks". In the heavy wet on the steepest slopes great chunks of earth fall away to wash down into the streams which drain the country. The Barron River with its tributaries is one of the main drainage systems of the country mentioned above and of course receives most of this earth. It is carried in suspension downstream by the flood waters.

When the speed of the flow slackens and the water loses its turbulance as it does, firstly when it reaches Tinaroo Dam and again below the dam at the wide river mouth and finally the sea, the silt is slowly deposited. At Tinaroo the water going over the dam is reasonably clear showing that most of the silt has been deposited on the floor of the dam. Below here the Barron receives much more highly mud-charged water, this time mainly run-off from farms that lose top soil each wet season and this is discharged into the sea just north of Trinity Bay. Here it meets the south-moving East Australian Current and is bourne slowly along where the silt finally deposits in the first calm water it encounters, i. e. Trinity Bay. This accounts mainly for the mudflats fronting Cairns and Mission Bay. South of Cape Grafton until the next river mouth, mud-flats are replaced by sand-flats and clean sand beaches such as those seen at Turtle Bay and Kings Beach, indicating that at least the bulk of the mud brought from below Tinaroo Dam has been left behind on the Cairns waterfront.

Jack Cassels.

#### SPRING ON A N.S.W. WHEAT FARM

On a warm spring day at "Carramar", a wispy breeze stirred the air over paddocks covered in the shimmering yellow of the cape-weed. Down by the creek I sat on a white sandbank, shadowed by trees and enjoying the sounds of the running water and the scent of the golden wattles that grew close by. Opposite red banksias hung over the creek beside a patch of rushes. Insects hummed drowsily.

Presently, a grey shadow passed in front of my eyes. Looking up, I saw a grey form hop along a shadowy branch of a gum tree. Then lightly it flew from its hidden perch and darted out over the water to land on a twig, showing itself as a grey shrike-thrush. It eyed me speculatively, then it was gone; but from a wattle nearby came the ringing notes, pure and varied, of one of the most melodious of bush singers.

A flock of white winged choughs rowdily arrived and formed a circle round me, protesting in their shrill way, hopping from branch to branch and craning their necks inquisitively, their eyes flashing. Seeing no harm in me, they started probing bark on the trees and combing the ground thoroughly, tossing leaves about as they went. If one found something it would usually bring the others around and a great argument would ensue, with much pushing, shoving and complaining. So they made their way along the creek, often spreading their white-edged wings to glide for a few yards before alighting again. Even after they disappeared I could still hear their noisy progress.

A sound of scratching and rending of bark broke the stillness. A faint lisping song came to my ears. There, hanging from a piece of bark above me, in yellow breast, white-throat and black crest and wings, was a male eastern shrike-tit, busily at work. Soon the sound of rending bark came from every direction and these small birds were flitting whereever I looked, hopping up the tree trunks or hanging upside down from strips of bark. One moment I was by myself and the next I was surrounded by them. They took no notice of me, coming right up. Then the flock vanished.

The soft cooing of doves drifted from a dark alleyway of greenery up the creek. A cormorant flew round a corner and seeing me, noisly flapped onwards. Opposite, a tall gum was covered in creamy-white blossom which attracted hosts of scolding lorilets, twittering silver-eyes, squawling friar birds and rowdy soldier birds (noisy miners). Over the wheat paddocks flocks of galahs rushed in wheeling, shreiking groups; a flick and the open country was full of pearly dove-coloured shapes; another flick and it was filled with blood-red darting bodies - a sight of which I never get tired. Small flocks of flashing green budgerigars also pelted over the paddocks or hurled themselves through the trees to seethe round on a sandbar, shrilly chittering and arguing amongst themselves. Crested pigeons padded over the white sand, bowing and cooing quaintly to each other.

To a last rousing chorus from the kookaburras, a typical spring day ended as the setting sun turned the tops of the trees to gold and the pearly-grey dusk came over the bush.

John Crowhurst

### THE NORTH QUEENSLAND

NATURALIST

CAIRNS

Journal of

#### NORTH QUEENSLAND NATURALIST CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS — The Furtherance of the Study of the various branches of Natural History and the Preservation of Our Heritage of Indigenous Fauna and Flora.

ADDRESS — Box 991, P.O. CAIRNS. North Queensland, Q. 4870, Australia.

MEETINGS — Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS — Sunday before meeting. Notice of place and time given in "Cairns Post".

#### Subscriptions (Due September 30):

City and Suburban Members, \$2.50. Country Members, \$2.00.

Junior Members, 50c.

| Vol. 35.                      | JULY   | 7, 1968. | •       |       |      |      | No. 14 | 6. |
|-------------------------------|--------|----------|---------|-------|------|------|--------|----|
|                               | CON    | rents    | 5.      |       |      |      |        |    |
| Club Handbooks                | ****   |          |         |       |      |      | ****   | 2  |
| Editorial                     |        | ****     | • • • • | ••••  |      |      |        | 2  |
| A New-Comer to Australia Re   | membe  | ers the  | Afri    | can B | ush  |      | ****   | 3  |
| "Australian Sarcanthanae"     | ****   |          |         |       | **** |      |        | 5  |
| Pot Pourri                    | ****   | ****     |         | ****  |      | **** | ****   | 6  |
| Quail of North-East Queenslan | ıd     |          |         | ***   | **** | **** | ****   | 7  |
| Request for Information on Mi | igrant | Birds    | * - * * | ****  | **** |      | ****   | 8  |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers — September 30, 1968 to September 30, 1969.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

#### CLUB HANDBOOKS.

| Check List of North Queensland Orchids     |    |         |      | 1 * 1 * | **** | 75c |
|--|----|---------|------|---------|------|-----|
| Check List of North Queensland Ferns       |    | A = + + |      |         | **** | 10c |
| Edible Plants in North Queensland          |    |         | **** | ****    |      | 20c |
| List of Birds Occuring in North Queensland |    | ••••    |      | 8 + + 5 | *119 | 20c |
| Marketable Fish of the Cairns Sea          |    |         | **** | ***     | **** | 10c |
| Check List of Australian Dryopidae         |    | 4 + + + |      | ****    |      | 5c  |
| (Plus Postage)                             | ), |         |      |         |      |     |

#### EDITORIAL.

News of Club activities in recent months includes some interesting discussions at meetings, a showing of excellent films by courtesy of C.S.I.R.O. and others, enjoyable and rewarding Field Days to Double Island, Mourilyan Harbour and Fitzroy Island in particular. A good attendance of visitors as well as members on occasions has been very pleasing. Some few members have collected specimens of frogs (Cophixalus) and of Helichrysum flowers in response to requests from Universities of Queensland and of Berlin. Fresh material has been added to the Flecker Herbarium by Dr. Brass. At the Cairns Show, a display of fine photographs of "wild" life was provided by Mr. and Mrs. Hinton under the title, "Yours to Protect".

Regarding protection, we note with concern that routine statements issued by the Fauna Officer of the Department of Primary Industries to local Press, declaring an open season on certain species of duck, etc., fail to add that this does not apply within sanctuaries and that a large area of North Queensland — from Cape Tribulation south to Mission Beach and west to Mt. Garnet — is such a sanctuary. Surely the existence of sanctuaries should be made clear in every such statement.

Do please remember that contributions for this Journal are always welcome.

### A NEW-COMER TO AUSTRALIA REMEMBERS THE AFRICAN BUSH.

To an amateur naturalist who lived for eleven years in Central Africa, it was very interesting to arrive in North Queensland and to look at the new environment with an experienced eye. Zambia and North Queensland are situated about the same distance south of the equator and so their general conditions of temperature, seasons, amount of sunlight etc are the same. Both places are part of old, worn-down continents and the soils found in both are the result of millions of years of erosion of ancient rocks. However, Zambia is situated right in the middle of a great land-mass and has no coast-line or coastal-plain. Average altitude is 3,000 ft. above sea-level, and so it is only in the deep river valleys that hot, humid conditions like those round Cairns are found.

Because it is so far from the coast, rainfall is relatively low, 30 - 40 ins. per year compared with Cairns' 80 ins., but conditions are very like those found on the west side of the Atherton Tableland. The original indigenous flora and fauna of the two localities is distinct, presumably as a result of independent evolution over a very long period.

Among African countries Zambia is lucky in not being over-populated. Compared with countries like Uganda and Malawi, Zambia still has plenty of land for her people, but they do exert more pressure on the land than do the aborigines here, because they are cultivators as well as hunters. Under modern conditions, white men are having much the same effect in both countries, shooting animals, flooding valleys, felling forests and spreading urban development and mining slag-heaps.

Rain-forest such as exists on the coastal ranges here, is found in Zambia only in a few, isolated localities. The most interesting is on the lips of the gorges near the Victoria Falls. As the mile-wide Zambezi River tumbles into its narrow, basalt gorge, a great cloud of spray is thrown up, "The Smoke that Thunders" is its Bantu name. The narrow strip of land on which the spray lands is always saturated, and the rain-forest found there contains giant trees, lianas and epiphytic ferns and orchids like those we find in the rain-forest here.

Scattered over the northern part of Zambia towards the Congo border where the rainfall exceeds 40 ins. per year, there are little pockets of residual rain-forest, known as "mushitu", along the beds of streams and around water-falls. As one picks one's way through the dense vegetation growing out of a thick layer of litter, one feels that one is, indeed, penetrating part of a forest literally as old as the hills.

However, the major part of Zambia is covered by dry, open woodland, with savannah in the drier parts to the west where the trees thin out and the vast plains of elephant grass are the homes of herds of antelope and other game. Brachystegia-Isoberlinia woodland is found in many parts of the country and in September the red and bronze colours of the new foliage make a picture of "autumn tints" at the wrong season. In the valleys of the great rivers, Zambezi, Kafue and Luangwa are found the "mopane woodland" beloved of big game. The dry, scrawny-looking trees have leaves like pairs of wings, and bear succulent pods. When all the grass is dry and flavourless, elephant and buck find the mopane bushes very much to their taste. Among these small trees stand out the giant baobabs with gross, grey trunks and bare branches like up-ended roots. They are related to the bottle-trees of Australia.

Zambia is known as the land of the three rivers, and, of these the Zambezi is the most important, curving round the western and southern borders of the country and forming much of its frontier with Angola and

Rhodesia. At one point in its long course, the giant river crosses a vast flood-plain known as Barotseland. Perhaps this tract was once the bed of an ancient lake, and every year from January to May it fills up as the Zambezi burst its banks and forms an inland sea, 30 miles wide and 100 miles long. This mass of water is the home of myriads of wild birds; open-billed storks, which live on snails; ibises; fish-eagles (Zambia's national emblem), many kinds of kingfisher and many others. When I saw the birds on the lagoon at Minimalka Station near Mount Garnet I thought I was back in Barotseland, except, of course, for the unique black swans.

Unfortunately all the small streams and lakes are infected with bilharzia in Zambia if any Africans live near and use them for washing etc. Bilharzia is a small parasitic worm which spends most of its life in the bladder of a human host, but the free-living stage of its complicated life-history swims about in water. This little larva can penetrate unbroken human skin, and a heavy infestation can cause an unpleasant and debilitating disease. To all careful people, therefore paddling or swimming in Zambia's rivers is taboo because of bilharzia if not because of crocodiles. How very much we appreciate the lovely swimming places in Australia's beautiful rivers!

Zambia has natural and artificial lakes, just as North Queensland has. Lake Kariba, formed by the damming of the Zambezi River where it flows through a narrow, rocky and exceedingly hot gorge, is a vast inland sea compared with Lake Tinaroo. It has changed the local weather by evaporation from it huge surface and may even have caused some earth tremors by its weight. In contrast to the irrigation purpose of Lake Tinaroo, Kariba is used for hydro-electric power exclusively. We may be thankful that Tinaroo seems unlikely to become a political bone of contention like Kariba which was made jointly by Zambia and Rhodesia in earlier, friendlier days.

North Queensland is unique in possessing several crater lakes of great beauty and interest. Zambia's natural lakes by contrast, include the rift-valley lake of Lake Tanganyika. Zambia only borders this huge lake in the extreme south. Lake Tanganyika is a miniature sea of which the opposite shore is invisable and the nearby shore has sand-dunes on which break real waves. Elephants walk along the beach, hippos feed in the shallows, and Nile perch and yellow-bellies of great size lurk in the deep water. Sudden squalls can come up which keep native dug-out canoes very close in-shore and send all shipping running swiftly for harbour.

Although Zambia has an incomparably richer fauna of mammals than has North Queensland, I think Australian birds are more colourful, melodious and numerous than Zambian birds. There are no big parrots in Central Africa although I have seen some charming little rosy-cheeked love-birds. In gardens there are many pied wagtails, more boldly pied and much bolder in behaviour than Australia's willy wagtail. In every garden, too, there are hosts of tiny wax-bills, brown-backed and blue-breasted, always feeding under the poinsettias and frangipanis. Mynahs have not yet found their way to Central Africa, but one common bird seen in both countries is the coal-black, forktailed drongo. I cannot describe in detail the spur-winged geese, egrets, kites, eagles and many other beautiful birds, but we all know the comparison between the flightless African ostrich and the Australian emus and cassowaries.

Of all the lovely flowers which I found in the African bush (and some of which I sent to the Herbarium at Kew), I remember vividly the many small ground orchids and gladioli which I collected in the dambos. These dambos are curious low-lying areas in the bush where the ground is often damp, and where trees will not grow. The soil is often pitted with elephants foot-marks, big enough to take the stump of a North Queensland house, and dambos are also favourite places for buck and zebra to graze at dawn and dusk. Here in the gardens of Cairns I watch with affection for the scarlet Haemanthus lilies in November; I saw them in the Victoria Falls rain-forest and many

times on huge ant-hills in the bush. The climbing flame-lily is my favourite "remembrancer". It grows all over Zambia and was the national flower.

Blue-gums have been introduced into many parts of Zambia for making straight poles. African trees are very poor pole-producers because they are hacked at by the Bantu and crippled every year by bush fires. The umbrellatree here seems to me to be unique and characteristic of the small rainforest trees.

If any one particular thing were to be chosen as having an over-whelming attraction for visitors to Zambia, it would be the game. Not only are herds of such animals as roan-antelope and groups of crocodiles seen in the big game-parks, but at any time of the day you may have monkeys come into the trees of your garden, and any night you may see hyena or even leopard in the beam of your head-lights. Undoubtedly, the grace and beauty of form and colouring of these animals lends a very special appeal to the African bush, and the remnants of the Australian marsupial fauna in North Queensland are poor in comparison.

An uninformed visitor from a cold country might find many similarities between the natural country-side of Zambia and North Queensland, especially if he visited the Mareeba area. Sparse trees, tall grass and termite hills make very similar pictures, but to the naturalist there are, of course, many interesting differences. As an English naturalist I took eleven years to feel as familiar with the African wild scene as I did with the primroses and robins of my youth, and I know that I shall be as fond of North Queensland nature after a comparable sojourn.

JOAN M. WRIGHT, M.A., B.Sc

Cairns 1968.



-0-0-

By A. W. DOCKRILL.

#### AN APPRECIATION:

This work is a pure scientific paper. As such it doubtless has received and will continue to receive as it becomes better known, the favourable recognition deserved, from scientists world wide.

To qualify for "popular science", such a work must necessarily have a mass of redundant deviations and embellishments normally necessary to encourage the interest of persons with little intimate knowledge, though not without some fair inclination to that particular field of science. In this paper there are no such extravagances.

It describes a part of that order of the plant kingdom, "Orchidales", which, as the word "Orchids", has aroused in increasing numbers of people over recent centuries, a desire to extend their knowledge of the plants and their cultivation.

The part selected, the subtribe "Sarcanthanae" includes a number of species widely known horticulturally, as well as others with generally minute flowers, but these even more fascinating in colour and form.

The unusual, if not unique, feature of this work is an illustration to scale, of the plant, its flowers and their parts, of each species described. The descriptions, although in mostly scientific terms, are so lucid that almost every one with any enthusiasm could, by careful comparision with the match-

ing illustrations, identify most of the species described. Indeed, in some cases, the illustration is sufficient.

No handbook of popular descriptions, even if available, could so expand the chances of the novice and non-scientific amateur and professional, of making an accurate diagnosis of the hitherto obscure names of so fascinating a section of the Orchids.

Thus( Alick Dockrill has achieved that rarity:-

A popular science production without a blemish on its purity.

J. BERRY.

0-0-

#### POT POURRI.

#### BIRD CATCHING SPIDERS.

I have heard many people scoff at the thought that a mere spider could catch something as large as a bird in its web, but I have had two instances when this has happened.

A few years ago whilst taking an American bird watcher out near Edmonton we saw a small bird tangled up in some very strong web. We unravelled the poor little thing to find it was a very juvenile Fantailed warbler (Cisticola exilis). Fortunately the baby was not dead and flew away after a few minutes.

The other occurrence was this year when once more I was taking an American visitor on a Field trip. We were on the road to Mareeba when I saw something hanging from a strand of silk. I stopped the car and went over to investigate. This turned out to be a juvenile Brown honeyeater (Gliciphila indistincta) who was caught by one leg to a strand of silk. Though it fluttered feebly from time to time it was unable to extricate itself. We quickly pulled the web from its leg and released it and like a rocket, its parent flew down from a nearby tree to look after it once more.

M. L. CASSELS.

0-0-0

In late June 1968, I collected three large caterpillars from the moss-covered trunk of a palm on a creek bank near Babinda.

These insects were 38 mm. long and 5 mm. in diameter and their backs and sides were covered with barbed hairs about 16 mm. long.

I placed them in a jar for further observation and they pupated two days after being collected.

The pupal case was naked, as in many moths, but the caterpillars had constructed a roughly elliptical basket around their respective pupae by crossing a large number of the long barbed hairs and binding them together with silk. These baskets were neatly made and the hairs crossed each other at approximately right angles. Roughly in the centre, and parallel to the long axis of the baskets, the pupae were suspended by silk strands and by some of the long hairs which were attached to the pupa by silk.

Scattered irregularly over the pupa's body were a number of short strong spines whose tips ended in blunt hooks or a short spiral. A few of these spines were at the posterior point of the pupal body and it was to these and those on other parts of the body that the suspending silk and hairs were attached.

N. C. COLEMAN.

#### **QUAIL OF NORTH-EAST QUEENSLAND**

The members of the true Quail (Phasianidae) and the Bustard Quail (Turnicidae) families are well represented in north-east Queensland. The Phasianidae comprises three species: Brown Quail Synoicus australis, King Quail Excalfactoria chinensis, Stubble Quail Coturnix pectoralis. The Brown Quail and King Quail could be said to be more or less resident species and the Stubble Quail more of a nomadic species.

The Bustard Quail (Turnicidae) are represented by the Red-backed Quail Turnix maculosa, Painted Quail T. varia, Buff-breasted Quail T. olivii, Black-breasted Quail T. melanogaster, and Red-chested Quail T. pyrrhothorax. The Red-backed Quail is more of a resident species and the others have some nomadic tendency.

In the true Quail (Phasianidae) the male is usually larger and more brightly coloured than the female, and it is the female who incubates the eggs and rears the family. In the Bustard Quail (Turnicidae) the position is reversed and it is the female who is the dominant member; after laying a clutch of eggs she leaves the smaller and duller coloured male to incubate the eggs and look after the young chicks while she attracts another male. True Quail possess a hind toe which is lacking in the Bustard Quail family.

#### HABITAT.

Quail frequent dense grassy situations, lucerne fields, fodder crops such as wheat, oats and maize and the taller grass lands especially Guinea grass which is abundant on many road margins. In these grassy situations Quail are very adept at concealing themselves, so much so that many experienced observers rarely see these elusive small birds except for a fleeting moment or two if they are accidentally flushed, usually when not expected, which leaves very little opportunity for any detailed study.

#### **FLIGHT**

The Brown Quail has a disconcerting habit of rising with a startling whirr, and usually flies a considerable distance before dropping to cover. Stubble Quail are harder to flush and if in a family covey often fly in all directions, which is an advantage if attacked by predators who then tend to be confused, leaving more time for the birds to gain cover. King Quail are much smaller and usually prefer to lie close and only flush reluctantly and when they do, fly only a short distance to suitable dense cover.

Bustard Quail generally are difficult to flush, prefering to stay concealed in good cover. The Red-backed Quail has a steady flight if flushed, and the wings do not make so much noise as the Brown Quail. The Painted Quail has a steady and wavering flight and besides frequenting farmlands can at times be flushed in open Eucalyptus clearings, especially near the foothills of mountain ranges. The Buff-breasted Quail is a rare species frequenting the savannah lands of central Cape York and has some resemblance to the Chestnut-breasted species of the Northern Territory. T. olivii is named after a collector who was a member of a well-known Cooktown family, and was probably the last species of Australian Quail to be located. The Red-chested Quail is a rare species and some seasons is absent, having nomadic tendency. This handsome species has a habit of standing on tiptoe and looking around before going to cover. Also this species does not often flush, prefering to hide close to the ground and at times can be caught by hand. The Blackbreasted Quail is a very rare species and probably the largest of the Bustard Quail family. This species prefers to reside in a scrubby habitat, especially is it fond of Lantana thickets.

#### NEST AND EGG CLUTCH.

The nest is in a depression lined with fine grass and is usually protected by a rank tuft of grass or a small shrub. True Quail (Phasianidae) have from

six to eight eggs usually. The Brown Quail often has very large clutches of eggs. On one occasion I located a nest of fourteen eggs. Bustard Quail do not have large clutches, three or four eggs being average. Breeding is governed by the season; the monsoon season, when seeding grasses are abundant and insect life is prolific, is favoured by most species. If the season has been favourable Quail are more numerous but in dry years there is a tendency for some species to leave for other areas where conditions are more favourable.

#### OBSERVATION.

Observers who reside in town areas do not have as many opportunities to study Quail as do those who live on the land, and who during farm operations regularly move through grassy situations where the elusive birds reside. Even so members of the Quail family are always difficult to locate. It is a great help for observers to visit farm properties when harvesting of fodder and crop areas is in progress. The usual harvesting procedure is to work from the outside margins and finish in the centre of the field. As harvesting progresses the birds move away from the mown to the uncut area and it is in the centre where the Quail congregate. It is an advantage for the observer to be on a tractor or a vehicle as a good view can be obtained from such a vantage point. I have often been amazed at the numbers of Quail of several species which are in the last strip or two of uncut field. A note of warning to observers is to keep well clear of moving parts of machines if they wish to try this method of observation.

#### DISPLAY.

At times a distraction display is observed. On one occasion a female Brown Quail with several small chicks in the vicinity would not flush but kept running in a circle around a tall grass tussock, at times falling over like a person under the heavy influence of alcohol, and dragging one wing. When in this display she uttered strong churring agitated notes and when approached closely crept like a mouse along the ground to a dense Guinea grass tussock where she kept watch on my movements.

Space will not allow me to give a description of the plumage of the various members of the Quail family. Reference books cover this very well and also give details of the various call notes.

#### PROTECTION.

An open season is usually declared in Queensland each year. This in my opinion is not justified. The small birds have many predator enemies and are so small that the food value is almost negligible. Quail do a very useful service keeping crops free of insect pests and do no damage to grain crops. In my opinion all members of the Quail family should be given total protestion.

J. A. BRAVERY, Atherton.

#### REQUEST FOR INFORMATION ON MIGRANT BIRDS.

For some time I have been working on migrant species of birds. Little is known about the routes taken from breeding grounds to wintering grounds. In most cases, many species probably fly along the coastal side of the range. However, much more information is needed so that these routes can be plotted with accuracy.

I would be particularly interested to hear from anyone who sees any species travelling in a certain direction regularly each year. Many species travel by night, and again, I would be interested to hear from anyone who regularly hears birds passing overhead through the night. Even a single sighting or a single night-time flight would be important, and in turn, I would be pleased to hear of it.

LLOYD NIELSEN, Box 12, Jandowae., Qld. 4410



# THE NORTH QUEENSLAND NATURALIST

#### CAIRNS

#### Journal of

#### NORTH QUEENSLAND NATURALISTS CLUB

#### Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

#### Subscriptions (Due September 30):

City and Suburban Members, \$2.50. Country Members, \$2.00.

Junior Members, 50c.

Vol. 35. NOVEMBER, 1968. No. 147.

#### CONTENTS.

| lub Handbooks  |              |   |             |       | • • • |       |
|----------------|--------------|---|-------------|-------|-------|-------|
| 1              |              |   |             |       |       |       |
|                | magian     1 | 1//311111111111111111111111111111111111 |             |       |       |       |
| Walk Up A Riv  | er Ben Consi | iabie<br>ia I. Mullei                   | and         | • • • | • • • | • • • |
| C. G. G. J. Va | n Steenis .  | • | • • • • • • | • • • |       | • • • |
|                |              |   |             |       |       |       |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers — September 30, 1968 to September 30, 1969.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

#### CLUB HANDBOOKS.

| Check List of North Queensland Orchids     |         |         | * > 4 % | 1 4 + + |       | 750 |
|--|---------|---------|---------|---------|-------|-----|
| Check List of North Queensland Ferns       | 4 + 2 4 | 1 + 2 4 |         |         |       | 100 |
| Edible Plants in North Queensland          |         | ****    |         | * * -   | * * * | 200 |
| List of Birds Occuring in North Queensland |         | ****    |         | 4 + 9 + | ****  | 200 |
| Marketable Fish of the Cairns Sea          |         |         | 4 * * * | 4 - + 1 |       | 100 |
| Check List of Australian Dryopidae         |         |         |         | 111     |       | 50  |
| (Plus Postage                              | 2).     |         |         |         |       |     |

#### EDITORIAL.

A report released in State Parliament recently by the Minister for Primary Industries indicates that the simple economics of the kangaroo shooting industry will safeguard the continued existence of the red kangaroo: that when 'roo numbers fall below an exonomic level, the number of shooters will fall also. The Minister further assured us that the kangaroo could live unmolested in inaccessible tracts of country where it was uneconomic for shooters to go.

Will our Minister ever be able to claim that our kangaroos and other native animals can be senn readily and in large numbers in a systme of scientifically controlled parks and sanctuaries throughout the State, and not merely as relicts behind the bars of a zoo? It has been achieved in other countries.

Christmas greetings to all readers of this Journal, and a gentle reminder that many more contributions are needer for its publication in 1969.

-000-

N.B. Could your subscription still be due?

#### FOREST FIRES AND EROSION

"Thou shalt inherit the holy earth as a faithful steward, conserving its resources and productivity from generation to generation."

"Thou shalt protect thy fields from soil erosion and thy hills from overgrazing by the heards, so that thy descendants may have abundance forever."

"If any shall fail in this stewardship of the land, his fertile fields shall become infertile stones and gullies and his descendants shall decrease and live in poverty or vanish from the face of the earth."

This quotation is called "the eleventh Commandment" and was written by an American soil conservation officer. It was written in the first place for the man who owns and uses the land, but city people are also affected by what happens on the land.

"Conserving its resources as a faithful steward" is meant for everybody. Natural vegetation, and forest in particular, is one of the resources. Natural vegetation, and forest in particular, is one of the resources.

Forests are particularly valuable for various reasons. Firstly, they are timber producing areas. Timber and timber products are the second largest item on our annual import bill.

Secondly, forests regulate our water supply by soaking up rainfall and releasing it slowly over a long period. They work like a sponge.

Thirdly, by intercepting the rainfall they protect the soil from erosion.

Finally, forests have an influence on local climate and form a refuge for wild life, necessary to keep the balance in nature.

Wild fires are the greatest enemy to the natural vegetation on non-cultivable land.

The influence of a fire on this protective cover and the soil is three-fold. Physical: Dry grass and forest litter give a fierce hot fire which kills all young trees, preventing regeneration of the forest. It also weakens the stand of older trees. If this process of burning goes on year after year the tree vegetation disappears, the rain has free access to the soil and erosion takes place. Eventually even grasses are unable to grow because of the lack of soil, and bare rock is the end of the process.

After just over 100 years of settlement in Queensland, we are well on the way of losing the soil, and this process of destruction is an accelerating one. Its effects can be seen in the bare eroded soils and sand-filled creek beds in the upper region of the Burdekin River.

Other effects are the flash floods in the rivers, and the dry season shortage of water.

Some of the costs which may be linked with this same process are the hundreds of thousands of dollars spent annually by State Government and Local Authorities on repairing roads, railways and bridges after the floods, and on dredging to keep our harbours open.

Biological: The biological aspect of fire is the killing of animals and insects. Soil is not a dead substance as the rock from which it was derived, but is alive with fungi, bacteria, earthworms, ants, termites and many other organisms. They live, feed, multiply and die in the soil. They transform organic and inorganic matter, increase the infiltration, change the structure of the soil and influence many other processes that take place in a fertile soil.

<u>Chemical</u>: Chemical changes take place as a result of a fire. Colloids are permanently changed by heating. Nitrogen is lost to the atmosphere and many minerals are more easily leached or washed out.

Man in his search for more cultivable land is of course the greater destroyer of the natural vegetation. However, wild fires are also an important agent in the destruction of vegetation and creation of conditions for erosion to take place.

To understand the importance of forest fires in the erosion process, we have to examine what happens when natural vegetation has been destroyed.

The main agents that cause erosion are water and wind. Of these water is the most important in this part of Queensland.

If you drop a big stone on the soil it makes a hole.

Energy is required to do this.

The total amount of energy from a good storms is tremendous, if you consider that 1 acre-inch of water weighs 100 tons and that this falls from a considerable height.

This energy has to be dissipated.

When rain falls on land protected with vegetation, the falling drops are intercepted by the trees, the undergrowth and the grass. The energy is dissipated here. Clean water filters through the surface litter into the soil and eventually reappears as springs to feed the creeks and rivers. This is the sponge working, as mentioned earlier.

Once the protective cover has been removed, the full force of the raindrops hits the bare soil.

It is the impact of raindrops on beare soil that starts erosion. In this case, the energy dislodges small soil particles which are thrown up in the air and brought into suspension. The resulting muddy water blocks the pore spaces in between the soil crumbs and a surface crust is formed. This crust inhibits further infiltration and the result is run-off on the surface.

Soil is moved down the slope in two ways: the fine material in suspension and the coarser material through the scouring effect of running water on the surface. To the farmer this means the loss of productive land, on uncultivable land it means that creeks and rivers are choked with rock, gravel and sand.

This material, deposited where it is not wanted, may damage roads, rail-ways and bridges. The rivers may even change course and destroy productive land lower down the slope or overlay farm land with useless material. The silt in suspension is deposited in harbours and along the coast, causing all its associated problems.

For the farmers there are ways and means to keep this man-made erosion to a minimum; on all other land we have only the natural vegetation to rely on for protection.

What has erosion done in the past?

Life and therfore agriculture flourished in the Middle East ages ago. The valleys of the Euphrates, Tigris, Jordon and the Lebanon were once centres of great civilizations. Today these areas are barren wastes, stripped of natural vegetation and fertile soil. They are a good example of man's destructive powers and of uncontrolled erosion.

In China the Yellow River has over the ages built up its own bed 40 feet above the surface of the surrounding country - a result of de-forestation followed by erosion in the upper regions of the river.

In North America, in recent times, over 50 million acres of cultivable land were lost after the removal of the natural vegetation follower by unwise land use.

In Queensland we have 4 million acres under the plough, of which the biggest portion once was ocvered with forest. At present  $1\frac{1}{2}$  million acres are in urgent need of protection from soil erosion.

These examples show what erosion does, and forest fires contribute much to the start of this destructive process that ends with bare rock.

There are other aspects in relation to forest fires which I have not mentioned. I feel it is quite obvious that to look at green trees is more pleasing to the eye than to look at bare rock or black stumps.

J. D. Veurman - Soil Conservation Officer, Atherton - from an address to the N. Q. Naturalists' Club, Feb. 1965.

#### A WALK UP A RIVER.

-0-0-

I went for a walk at Easter (1966) up the .... River. I did not get right up to the high country, where there are some good rock holes full of fish. However I went up the creek about 14 miles. I caught one fresh water crocodile as it was trying to swallow a frog (the frog escaped), but I let it go. I am very soft-hearted as far as all reptiles go. I also saw a beauty submerged in a shallow pool. It was over 4 feet long. I stroked it on the tail and it made no movement, so I poked it with a stick, whereupon it did a backward somersault and shot for the open river. When going on trips like that I always carry a rifle, but only use it for what I consider vermin - mainly pig (of which I shot two). All through the night, when I got up to stoke the fire, I would shine the torch up the creek and see the red eyes of fresh water crocodiles all over the place, most of them small but the occasional large one. There were plenty of tracks in the sand, too; also many dingo tracks, although I did not see any in the flesh. I saw jabirus and a duck with young, and many other water birds, mainly shags, herons and bitterns. I caught enough fish for a feed and cooked them in the coals. But by then I was getting a bit lonely - two days are enough

for me with no one to talk to - so I headed back, and got to the road at dusk. A walk of 30-odd miles over rough going in less than 48 hours certainly had its effect on me next day, but it was a pleasant trip.

Ben Constable.

\*River not named for the sake of its crocodiles.

### THE GENUS SONNERTIA IN AUSTRALIA with notes on Hybridization of its two species

J. MULLER AND C. G. G. J. VAN STEENIS Rijksherbarium, Leyden, Netherlands.

In a previous paper (1) we have treated the material of <u>Sonneratia</u> in Queensland and the Northern Territory as far as represented in the Brisbane Herbarium.

We have now examined also the material in the herbaria at Sydney, Melbourne, and new material collected by Dr. C. den Hartog in 1967.

This has yielded some interesting data. It confirmed that Sonneratia occurs only scattered and that the number of localities is fairly restricted, and that in several localities the number of trees is small, or even very small. Also the remarks by MacNae (2), who mentioned its occurrence from the mouth of the Daintree R., Johnstone R. and Darwin, emphasize the scarcity if compared with the mostly massive occurrence in the Malesian archipelago.

The most interesting discovery is that hybridization occurs, the second record known in this genus, and that the rarest partner, S. caseblaris, has hardly been observed in its pure form as far as collections are made.

As far as the material examined goes, the range of Sonneratia in Australia is from Sunday I. in northern western Australia eastwards to the Northumberland Is. off eastern Queensland.

According to Mr. L.S. Smith (in litt.) "Sonneratia occurs intermittently along the Queensland coastline from the tip of Cape York to at least as far south as near Proserpine."

On the accompanying map we have indicated the localities known to us. Fig. 1.

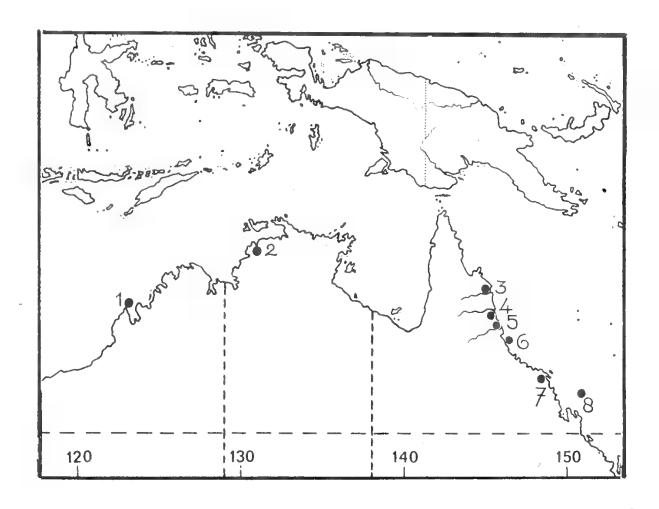


Fig. 1. Localities of Sonneratia in North Australia where collections were made. 1. Sunday I., 2. Port Darwin, and just east of it Adan Bay, 3. Cooktown, near mouth of Endeavour R., 4. Cairns, and Port Douglas Beach, south of the mouth of Daintree R., 5. Innisfail on Johnstone R. mouth, 6. Hinchinbrook Is., 7. Proserpine, 8. Northumberland Is.

#### Sonneratia alba J. Sm.

Only a few remarks are necessary because the larger part of the material is clearly S. alba. Curiously den Hartog collected near Cairns from one tree growing on the northern outskirts of the town, at c. 100 m distance from the house of Dr. L. J. Brass material in which no petals could be found, but in which a single spathulate petaloid stamen was observed.

Furthermore, there is often an anomaly with the fruit in which there is a shallow circular depression round the base of the style; in normal material the top of the fruit is flattish with a conical style-base elevated from it. As we

will mention later this depression is characteristic in all hybrids. It might point to a slight degree of sterility due to introgression, but we are not certain that all fruits observed were fully mature.

The following localities are known:
WESTERN AUSTRALIA. W. Kimberley, Sunday I., W. V. Fitzgerald, Nov.
1906, N. S. W. 85230.
NORTHERN TERRITORY. Darwin: Schultz 93 (MEL); Holtze 334, 340 anno
1883 (MEL); Point Stephens, Adan Bay, S. T. Blake 16953 (BRI); Bleeser 624,
Darwin, without precise locality, cf. O. Schwarz, in Fedde, Repert. 24
(1927) 88 (not seen).
QUEENSLAND. Cooktown, A. Musgrave 9/6/51, N. S. W. 85229; ditto, W. E.
Roth, 30/6/99 (BRI); Port Douglas Beach, W. T. J., without date or number
(BRI); Cairns: two small trees in northern outskirts of town near Dr. Brass'
house, Cairns, den Hartog 893 (no petals; fruit top with a depression) (L);
ditto, 1 tree in harbour, den Hartog 975 (L). Hinchinbrook I. at Scraggy
Point, S. T. Blake 18838 (BRI). Northumberland Is., Woods, without
number, probably S. alba (young fruit) (MEL).
Without precise locality: North Queensland: W. Hill 45 (or 48?) (MEL).

#### Sonneratia caseolaris (L. ) Engl.

This species surely occurs in Australia, but in a genuine form it has been collected only twice, on Endeavour R., Cooktown vicinity, and on Johnstone R., Persietz (Persich? or Persieh?) Oct. 1885 (MEL). Johnstone R., Dr. Th. L. Bancroft, anno 1886, sterile hence uncertain (BRI 063649); ditto, in fruit, G. H. Ladbrook, July 1917 (BRI 063648).

#### Sonneratia alba x Sonneratia caseolaris.

Above we have already remarked that a number of specimens show a slight discrepancy with the pure species in having a depression on the top of the fruit which might point to partial sterility. Indubitable hybrids are, however, also found. Den Hartog 1060 from Daintree R. has a depression on the fruit, with the latter only partly emerging from the calyx tube (receptacular tube), red filaments, and pollen of the caseolaris type, while the leaves resemble S. caseolaris, but it has abnormally large buds, with sometimes peculiar, large, wart-like, bulging, solid excrescences at the base, the same fruit anomalies as in den Hartog 1060, and a pollen sterility of c. 26%; it has red filaments and well-developed, wide, red petals, whilst also the leaves are those of S. caseolaris

We may add that similar anomalies as mentioned for these two specimens have also been recorded by one of us (3) from Brunei.

Finally we may again encourage that observations be made in the field and good collections made of complete material of single, marked trees. Hitherto we have not seen any complete collection of S. caseolaris.

#### REFERENCES

(1) van Steenis, C. G. G. J.: Do Sonneratia caseolaris and S. alba occur in Queensland or the Northern Territory? The North Queensl. Natur. (1968)

(2) MacNae, W.: Mangroves in eastern and southern Australia. Austr. Journ. Bot. 14 (1966) 67-104, 9 fig., 3 pl., especially p. 85.

(3) Muller, J. & S. Y. Hou-Liu: Hybrids and chromosomes in the genus Sonneratia. Blumea 14 (1966) 337-343, 5 fig.

574 N811





# THE NORTH QUEENSLAND NATURALIST

#### CAIRNS

#### Journal of

#### NORTH QUEENSLAND NATURALISTS CLUB

#### Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

#### Subscriptions (Due September 30):

City and Suburban Members, \$2.50. Country Members, \$2.00.

Junior Members, 50c.

Vol. 36 April, 1969 No. 148

CONTENTS.

#### 

Finger Cherry Poisoning - Fruit or Fungus? M.W. Jarvis ...

"Each Author is responsible for the opinions and facts expressed in his or her article".

#### **BIRD NOTES FROM CAIRNS**

Albinoid Plovers

About eight years ago, a Mr. Hocking drew my attention to an unusual Masked Plover (Lobibyx miles) on the North Cairns Reverve. It proved to be a partial albino. It had the black cap and black markings under the wings, but the rest of the bird was pure white. This bird kept to a special territory on the Reserve and was there for many months. A visiting German ornithologist took a colour transparency of it there. Then the City Council decided to make that particular part of the Reserve into a swimming pool. Consequently the bird went away and was not seen again.

Several years later, when setting out on a Naturalists' Club Field Day, I observed two partial albino plovers on the City Council Chamber grounds. These were seen by several other people that day but were not seen again.

Just before Easter 1968, my son stated that he had once more seen an albinoid plover and a day or so later I also saw this bird in McLeod Street. I have been told that an albinoid plover has also been seen around the Hambledon Sugar Mill.

It would seem that this albinoid strain is passing down the generations, as it is very unlikely that the bird seen today is the same bird that was seen eight years ago.

Display of the Victoria Rifle Bird

I have been very fortunate in seeing two distinct displays by the Victoria Rifle Bird (Ptiloris victoriae).

The first display took place right at the top of a dead tree in Black Mountain Road near Cairns. The female had flown to a projection just below the male bird and was out of my sight. The male formed his wings into a circle so that it was possible to see the sky right through them and then proceeded to sway down and to the side, backwards and forwards many, many times, with the wings always in the circle. This lasted for several minutes and my companions and I had a clear view of him the whole time.

My next display was of quite a different sort. In the same patch of jungle I saw a male bird on another shorter dead tree. At first I thought he was sitting in a mud bowl, but suddenly he placed his feathers together again and I could then see that the "mud bowl" was nothing more than his own feathers fluffed out. A year or so later, whilst along Black Mountain Road again with an American birdwatcher, we were privileged to see a similar display. However this time I could see the whole of the bird. With his feathers fluffed out, he looked like a ballet dancer with black bodice and tights and a lighter grey ballet skirt. He stayed in this position for several minutes, then dropped the feathers down and resumed feeding.

Crested Pigeon in Cairns

Just before Easter, 1968, I was astonished to see three Crested Pigeons (Ocyphaps lophotes) walking along the road near the North Cairns Reserve. The nearest to Cairns that I have observed this species is between Ravenshoe and Archers Creek, about 100 miles away. I do not know if these birds were escapees from an aviary. They have been seen by a number of other bird watchers in the town.

### PECULIARITIES OF WILD LIFE AT MERLUNA STATION, CAPE YORK

Merluna Station is a large area and it has quite a number of lagoons scattered around, many of them large expanses of water. And yet there are no water fowl other than a few black and white ibis, which feed in water only two and three inches deep. I lived and worked as a stockman on Merluna for 12 years. There were odd times when one of the Aboriginal stockmen would suddenly say to us all, "Miagoodie?" (Guess what?). Of course we all looked in trees and on the ground until he told us to look upwards. Away up in the blue sky would be 10 or 12 pelicans (Cuchinuchie, native name) flying in formation, very high up. They never land on any lagoons on the station. Twenty miles east of the station near the Batavia River is a lagoon where, at certain seasons, pelicans are so thick that they get tangled up with one another's wings. Thirty miles south of Merluna on a large sheet of water we have often seen 20 or 30 sailing around doing a spot of fishing.

Occasionally, too, one of the Aboriginal stockmen would alert us in the same way and high up in the sky would be two galahs, their calls coming to us quite plainly. And that was the closest that galahs ever came to land on Merluna country. Around Coen and Mein and for 5 miles north up to Guider Creek there were galahs, but from the Guider north to Merluna (23 miles) or on any part of the station we did not see any. The grass seed they ate at Mein, to the eye, did not appear to be any different from that on Merluna. Of course the soil was different in places, but the trees were the same.

Stanley H. Boyd.

-000-

#### **BOOK REVIEWS**

YOUR AUSTRALIAN GARDEN, No. 4 Grevilleas, 50c. Published by the David G. Stead Memorial Wildlife Research Foundation, Box 4840, Sydney. This 32 page booklet is the fourth of a series which should prove helpful to anyone interested in the cultivation of Australian plants. About 75 of the approximately 250 species of Grevillea are described, with practical details for the home gardener of their height, spread and habits of growth, and their propagation and cultural requirements. Line drawings illustrated some of the many forms of leaf and inflorescence.

VENOMOUS AUSTRALIAN ANIMALS DANGEROUS TO MAN, edited by J. Ros. Garnet, published by Commonwealth Serum Laboratories, Parkvill, Victoria. This small book gives a general and most interesting account of the marine creatures, Arthropods (centipedes, spiders, ticks, etc.) and reptiles of Australia which can inflict venomous bites or stings, with mention also of the poisonous qualities of certain fish and molluscs when eaten. Chapters are included on the distribution and identification of the more deadly snakes, and on the treatment of envenomation. Final paragraph of the Preface states: "Antivenenes are available for treatment of poisoning by any of the dangerously venomous snakes, by the ubiquitous red-back spider and by the stonefish of tropical waters and we feel sure that eventually a method of producing an antivenene for funnel-web spiders, the sea wasp, and even the ringed octopus will be devised." The book is clearly illustrated with line drawings and excellent black and white photographs.

Club Officers - September 30, 1968 to September 30, 1969.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

#### CLUB HANDBOOKS.

| Check List of North Queensland Orchids     | *    |     | <br>    |      | 75c |
|--|------|-----|---------|------|-----|
|  |      |     |         |      | 10c |
| Edible Plants in North Queensland          |      | *** | <br>    | 17.1 | 20c |
| List of Birds Occuring in North Queensland |      |     | <br>*** |      | 20c |
| Marketable Fish of the Cairns Sea          | **** |     | <br>    | **** | 10c |
| Check List of Australian Dryopidae         |      |     | •       |      | 5c  |
| (Plus Postage                              | ()   |     |         |      |     |

#### EDITORIAL.

To one recently returned from the somewhat drab grey-greens of Sydney bush, North Queensland in the "wet" seems brilliantly green, all a-glowing and a-growing. The National Parks, bush-filled sandstone gorges and beautiful waterways round about Sydney are indeed a saving grace of this (to mere country cousin) overwhelming city. However, broadcast warnings against swimming at those beaches and waterways because of sewerage and industrial pollution, may serve as a warning to us also - a warning not to allow our coastal rivers and Reef waters to become so polluted. One thinks of the sewerage farms near Melbourne where waste material is put to good use.

Our club president and secretary have been spear-heading efforts to preserve the Cairns foreshore as a Bird Sanctuary, and we have joined the fray to try to prevent any drilling for oil on the Great Barrier Reef.

With regular meeting and field days resumed a busy year is under way. Do come along when you can, and send some contributions for the Journal.

#### THE HOARY WATTLED BAT OF NORTH QUEENSLAND

In 1852 John Gould, in his great work "The Mammals of Australia", described a small bat, Scotophilus nigrogriseus, collected in the vicinity of of Moreton Bay. The accepted generic name is now Chalinolobus for this little insectivorous bat that may be recognized by the wattle-like fleshy lobes at the corners of the mouth. The pelage is greyish-black; dull white tipping of the hairs accounts for the somewhat grizzled appearance. The forearm is barely an inch and a half in length (in some New Guinea "flying foxes" the forearm measures more than eight inches).

The first record of Chalinolobus nigrogriseus from North Queensland came in 1948 when Dr. George Tate and I visited the farm of Mr. Seagren, located about ten miles west of Cooktown. We collected three specimens that were hawking insects near his home at dusk. In 1949 Jack Roberts, our host and friend at Shipton's Flat (about 30 miles south of Cooktown) during the 1948 Archbold Expedition, collected four additional specimens.

Ten years later R. F. Peterson and Lionel Evennett, collecting near the Gregory River (24 miles south of Burketown), shot another of these wattled bats. In June 1959 they took a specimen not far from the Queensland border in the Northern Territory at Red Bank Mine (18 miles west of Wollogorang). Then in 1961 William Hosmer, formerly of Atherton, sent me a <u>nigrogriseus</u> collected by his friend, George Powlowski, at Karumba on the Gulf of Carpentaria.

I now know of records of six additional specimens. Two males in the C. S. I: R. O. collection at Canberra were captured by Mr. P. Freney when they flew into his house at Chillagoe in 1964. The Australian Museum in Sydney has four individuals from Sedan Dip, about sixty miles northwest of Julia Creek.

Dr. Tate, in his 1952 report on the mammals of the Cape York Peninsula, identified the 1948 and 1949 specimens as Chalinolobus rogersi. This species was described in 1909 by Oldfield Thomas at the British Museum, who received a specimen from near Wyndham in the Kimberley area of Western Australia. After an examination of the accumulated material in the Archbold Collections, I have concluded that the Cape York and Gulf country specimens are not rogersi but nigrogriseus. The Kinberley rogersi is similar to nigrogriseus but it has a smaller skull and its pelage is more heavily "frosted". In my opinion rogersi should be regarded as a subspecies of nigrogriseus, the correct name being Chalinolobus nigrogriseus rogersi.

In addition to the Queensland records we know of specimens from five localities in the Northern Territory, and two localities in eastern New South Wales. All of these specimens, on the basis of descriptions and measurements, are considered as belonging to the nominate subspecies, C. nigrogriseus nigrogriseus. One fact stands out when all of these records are mapped. There is a gap of nearly 900 miles between the Moreton Bay and Chillagoe collecting localities. Naturalists in coastal Queensland should be on the lookout for this little bat, whose habits are practically unknown.

The question of the identification of these North Queensland specimens came up when I was attempting to identify a specimen collected on Fergusson Island (off the northeast coast of Papua) in 1891. After a detailed comparison of this New Guinea individual with the Queensland material, Dr. Karl Koopman of the American Museum of Natural History (New York) and I have concluded that the name nigrogriseus should also apply to the Fergusson Island specimen. We have a paper in preparation giving full details.

The above account is an excellent example of how little we know about the distribution of many of our local mammals. This bat is no doubt common in many parts of its range, but it was only after piecing together material

gathered over the years that a logical picture of its range began to develop. Resident naturalists can also contribute valuable information about the life histories of bats by systematic observation and judicious collecting. I will be happy to identify any small bat found or collected by readers of this Note. Simply put the specimen in "metho", after slitting open the abdominal cavity with a scissors or razor blade. A plastic food bag makes a convenient container for specimens. A dilute solution of formalin (one part to twelve of water) is even better than "metho". Dr. L. J. Brass (P. O. Box 1155) in Cairns will be glad to forward any specimens to me.

North Queensland is in an envious position as regards natural history. Not only is there a large number of available habitats, but there is also a wonderfully diverse mammal fauna. By a happy accident of geography Queenslands Cape York Peninsula has served several times in the past as a bridge for the interchange of mammal species between New Guinea and Australia.

Hobart M. Van Deusen

Archbold Expeditions
American Museum of Natural History
New York City
14 November 1968

#### PARASITISM OF COMMON OAK BLUE BUTTERFLY

The common oak-blue butterfly (Amblypodia amytisamphis) is plentiful along creeks and rivers in the Cairns district and its life history has been described in detail. As I have found their larvae feeding on three families of plants, always with attendant green tree-ants, it seemed opportune to me to observe them more closely with a view to finding their parasites, if any. As the eggs are never laid in the absence of ants from the food trees, and as the ants guard the butterfly from the time of egg-laying to the emergence of the adult, it might seem impossible for any parasite to get past the pugnacious ants. Over a period of one year I collected over sixty mature butterfly larvae of which four proved to be parasitised. These parasitised larvae were taken from young growth of eucalypts (Bloodwood and gum-topped box). I will describe the emergence of the parasites from two of these with some details of host reaction after emergence.

The parasitised caterpillars were active when collected but had ceased all activity two days before the parasite larvae emerged. They had not bound or rolled leaves together, as is usual in this butterfly prior to pupation. From the time of cessation of activity in the first host, it was examined with a binocular microscope morning and evening. The first lot of parasites emerged and had spun cocoons beneath the host's body before 6 p. m. Fifty-three emergence holes had been cut through the ventral wall of the host, two larvae had died without spinning cocoons. The cocoons were arranged in two double layers beneath the host in form like part of a honeycomb and they were formed of a yellowish white silk.

The heart beat of this host seemed regular for the first two days after the parasites emerged, the skin was glossy in appearance and the body generally appeared healthy. The host remained in one position clinging to the parasite cocoons beneath its body and it resisted attempts to remove it. On the second day after parasite emergence there were brief periods of side to side movement of the head - a movement that is common to many caterpillars when producing silk, but there was no sign of silk on the lower lip from which silk is normally produced. This movement had ceased next morning, the heart beat was much slower and there was an irregular short spasmodic movement of the body with an

infrequent opening and closing of the mandibles. On the fourth day, the host body showed signs of shrinking, it still moved slightly when touched, the mandibles moved slightly, and it still clung firmly to the parasite cocoons. Heart beat was still perceptible in the evening and there was a slight flow of light brown fluid from the mouth. On the morning of the fifth day, heart beat was slight with no sign of outer body movement, and the caterpillar was dead before 5 p. m.

The second caterpillar's parasites emerged early one evening and I saw most of these emerge and, almost immediately, commence spinning cocoons. All had emerged in about an hour and had spun cocoons by early morning - a total of 57 cocoons and a few dead larvae. The reactions of this host were much the same as the first case, but it lived only three days after emergence. This and the third parasitised caterpillar were examined by microscope in the same detail as the first.

The third host had been resting on a leaf with its back towards the bottom of the jar and, when first examined with the microscope, the parasites could be seen boring through the back from within the host's body. This was totally different from the previous cases and I replaced the calerpillar back upwards in the jar before leaving for the day. By 5 p. m. that day, four parasites had emerged and others were cutting their way out, all through the ventral wall. I killed the caterpillar and opened its body, in which there were still 79 live parasite larvae and a few dead.

The parasites emerged from their cocoons in 8-9 days after emergence from their hosts. They were small black wasps of the genus Apanteles of the sub-family Microgasterinae, and were about the size of a very small mosquito. Sex ratio was about 3 females to one male, and, where I was able to observe, mating took place within 24 hours of emergence.

N. C. Coleman.

DOLOGOUNG FRUIT OF FUNOUS

#### FINGER CHERRY POISONING - FRUIT OR FUNGUS?

M. W. Jarvis

(Contribution from Australian Defence Scientific Service, Department of Supply, Defence Standards Laboratories, Maribyrnong, Victoria)

The family Myrtaceae is very widely distributed throughout Australia and New Guinea, perhaps the most notorious member being a shrub or small tree growing extensively in Northern Queensland, known locally as "Finger Cherry" and "Cooktown Loquat" and botanically (1) as Rhodomyrtus macrocarpa Benth. This plant bears fruit which are of cylindrical shape,  $\frac{3}{4}$  to  $1\frac{1}{4}$  inches in length and which are an attractive cherry-red colour when ripe.

It has been reported on numerous occasions (2-9) that humans and animals who have eaten the fruit have suffered to varying degrees of severity with sickness, paralysis, permanent blindness and even death. It is an unusual feature of this plant's toxicity that damage which is both sudden and permanent is done to the optic nerve, resulting in its atrophy. That there is a definite association between consumption of the fruit of R. macrocarpa and these effects is beyond reasonable doubt; questions as to the nature of the toxic principle and its action still remain unanswered. However, this is not all that is extraordinary or inexplicable about this plants effects. Some reports (5, 6) have claimed that the unripe

fruit is the source of the toxin said by Tryon(4) a former Government Plant Pathologist, to be a saponin, the quantity of which shows a seasonal variation being in greatest concentration in the unripe fruit. Yet others (5) say that the ripe or over-ripe fruits are the culprits. Counter to all these reports is the statement by Banfield (10) that the blacks eat the fruit unrestrictedly and declare it even good, as do some white people, eating it raw and preserved, without fear and without untoward effects.

Nonetheless, the Queensland Department of Education considered the danger of poisoning so serious to children, who have been the most numerous of the victims, that in 1915 it issued illustrations and descriptions to be prominently displayed in all schools throughout North Queensland warning children of the hazard. Since then no Australian cases of poisoning have been reported, but the Courier Mail of Brisbane (11) carried the story that twenty-seven soldiers who ate "cherries" in New Guinea become totally blind as a result. Thus from time to time this plant takes its toll of the unwitting and the young.

A peculiar feature of Rhodomyrtus macrocarpa may help to explain some if not all of its unusual and varied effects. This is the fact that a fungus of the Order Melanconiales known as Gloeosporium periculosum Cke. et Mass (12,) has been reported (6, 13, 14) as growing only on this plant. It may be possible that this fungus is the true culprit behind the poisonings. This may explain the seasonal variation since G. periculosum grows only on the mature, ripe and over-ripe fruits; it may also explain why young children and stock animals who may eat infected fruit fallen to the ground are the most common victims and may explain why aborigines and others who know whether fruits are infected escape injury. It is these questions and others like them that scientists at the Defence Standards Laboratories in Maribyrnong, Victoria, are trying to They hope to find out whether the fruit, the fungus or the two together are the source of the toxic principles, the nature of these principles, their mode of action and if any antidote or treatment is possible. Information relating to the effects of this plant would be gratefully received by these Laboratories. It is hoped that as an outcome of the work done on this plant, a service may be provided to the parents of unwary children, the bush-walker and to the soldier training in the tropics.

#### REFERENCES

1.

Bentham, G., "Flora Australiensis" (1863), Vol. III, p 273.

Bailey, F. M., "Comprehensive Catalogue of Queensland Plants" [1912] p 207.

Cleland, J. B., Australian Med. Gaz., (1914), Vol XXXV, No.25, p 542, and

Tasmanian Agric. Gaz., (1914), Vol XXII, p 363. 2. 3. 4.

Tryon, H., Memoranda to Under Secretary, Department of Agric. and

Stock, Brisbane, Dec. 1st and Dec. 2nd, 1902.

5. White, C. T., Queensland Agric. Jour., Sept. 1921, p 194 and Queensland Agric. Jour., April 1935, p 416. Flecker, H., Med. Jour. Australia, August 1944, p 183-5.

6. 7.

D'Ombrain, A., Med. Jour. Australia, September 1944, p 263. Cleland, J. B., and Lee, D. J., "Venomous and Poisonous Animals and

Noxious Plants of the Pacific Region" Pergamon (1963) p 5-6. Francis D. F. and Southcott, R. V., "Plants Harmful to Man in Australia" Misc. Bull. No. 1, Botanic Garden, Adelaide (1967) pp 33-4

Banfield, E. J., "Confessions of a Beachcomber". Unwin Publ. London, 10. 1908, p 23.

Courier Mail (Brisbane) Dec. 27th (1945) p 2. 11.

Bailey, F. M., Dept of Agric., Queensland Bot. Bull., No. X (1895) p 37. 12. 13.

Simmonds, J. H., "Host-Index of Plant Diseases in Queensland" (1966) p 59. Herbert, D. A., Jour. Australia Inst. Agric. Sci., Vol 9 (1943) p 45. 14.

# THE NORTH QUEENSLAND NATURALIST - ROCT 1940

CAIRNS

Journal of



# NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):

City and Suburban Members, \$2.50. Country Members, \$2.00.

Junior Members, 50c.

Vol. 36

August, 1969.

No. 149

#### CONTENTS.

| Club Handbook   |   |    |     |    |    |     |   |
|---|---|----|-----|----|----|-----|---|
| Editorial   |   |    | -   |    |    | . 1 | 4 |
| North Queensland Coleoptera. Their food or host plants. | ] | Pa | art | IV | 7. |     |   |
| J. G. Brooks, B. D. Sc., F. R. E. S.                    |   |    |     |    |    |     | 3 |
| The Golden Bower Bird Marion Cassels                    |   |    | •   |    |    | . ( | 5 |
| The Genus Pachystoma Bl. in Australia Ian Walters       |   |    |     |    |    |     |   |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers — September 30, LIMI to September 30, 1969.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: MM J. MORRIS.

## CLUB HANDBOOKS.

| Check List of North Queensland Orchids     |  |  |  |  | 75c |  |  |
|--|--|--|--|--|-----|--|--|
| Check List of North Queensland Ferns       |  |  |  |  | 10c |  |  |
| Edible Plants in North Queensland          |  |  |  |  | 20c |  |  |
| List of Birds Occuring in North Queensland |  |  |  |  |     |  |  |
| Marketable Fish of the Cairns Sea          |  |  |  |  |     |  |  |
| Check List of Australian Dryopidae         |  |  |  |  | 5c  |  |  |
| (Plus Postage)                             |  |  |  |  |     |  |  |

#### EDITORIAL.

A well-attended public meeting in Cairns, arranged jointly by our Club and the Adult Education, concluded a recent lecture tour of Queensland coastal cities by Mr. Edward Hegerl of the Queensland Littoral Society. The importance of our association with this and other Conservation societies is great, and increasing, as local problems become increasingly common problems throughout state and country. Mr. Hegerl spoke on "Marine Conservation Problems of Queensland". He also mentioned the Society's Underwater Survey Section which conducts day, and night, surveys of fish species and numbers in certain localities.

Our club hopes to draw attention to the beauty and diversity of Nature in North Queensland with a window display at the Tourist Bureau for one month from 11th August. Members have put a great deal of work into preparing this display. Different habitats are depicted - reef and seashore, rain forest, and dry grassland - with painted backdrops for "atmosphere" and with appropriate fauna and discreetly potted plants (including a fine young stinging tree) arranged in most effective little tableaux. Above are beautiful displays of the Cairns Birdwing and other butterflies, moths, beetles, spiders, fungi, fossils, minerals. One segment shows the cycle of organic matter breaking down to return to the soil to nourish new life. Labels are clear and informative. Congratulations to those who planned and arranged it all!

The following extract from "Green Mountains" by Bernard O'Reilly was written 30 years ago. It is well worth noting in North Queensland today, when vast new land-clearing development schemes are under way.

"... The early givers of our land laws lost a splendid opportunity of making provision whereby the settlers and the wild life could live amicably together to their mutual advantage. The vanishing of many of Queensland's valuable birds has been due not so much to the indiscriminate shooting as to the complete destruction of the timber which provided natural habitats ... If a belt of natural timber varying from one to five chains wide, according to the area and location of the property, had been left around the boundary line of every holding in Queensland our feathered allies would still have been with us. Such things as grasshopper and caterpillar plagues would be non-existent; the dread blowfly scourge of the west would be curbed; the cane grub eradicated. The State would be a vast checkerboard of virgin timber and this new and urgent erosion problem could never have reached its present proportions. "

Do please send along more contributions for the Journal.

# NORTH QUEENSLAND COLEOPTERA. Their food or host plants. Part IV.

By J. G. Brooks, B. D. Sc., F. R. E. S.

I am again indebted to the Queensland Government Botanist for identifying the numerous plants submitted to him for determination. The areas of collecting have been extended to include Bowen, Ayr, Sellheim and Mt. Molloy.

Yellow Jacket. Eucalyptus ochrophloia F.V.M. Addenda.

# Family Buprestidae. Curis viridicyanea Fairm. Stigmodera (Themognatha) rigia Blkb. " " sanguineocincta Saund. " (Castiarina) andersoni L. & G. " " flavosignata Macl. " sexplagiata Macl. " straminea Macl. " vallisii Deuq.

Family Scarabaeidae.

Diaphonia palmata Schaum.

Trichaulax marginipennis Macl.
Lyraphora obliquata Westw.
Schizorrhina immaculata Lea.
Ablacopus trapezifera Thoms.
Chlorobapta frontalis Don.
Lemosoma tibiale Macl.
Glycyphana stolata Fab.
Clithria albersi Kraatz.

Family Cleridae.

Eleale lepida Pasc.

" pulchra Newm.

Zenithicola crassus Newm.

Cleromorpha novemguttata Westw.

Lemidia hackeri Lea.

Family Cerambycidae. Scolecrobrotus Westw.

All these species are blossom feeders.

#### A Yellow Stringybark. Eucalyptus acemnioides Schau

| Family Bu   | prestidae.      | Family Scarabaeidae.                           |
|-------------|-----------------|--|
| Curis virid | licyanea Fairm. | Hemipharis insularis L. & G.                   |
| Stigmoder   | a (Themognatha  | regia Blkb. Eupoecila australasiae Don.        |
| 11          | 11              | sanguineocincta Polystigma punctata Don.       |
|             |                 | Saund. Cacochroa decorticata Macl.             |
| 11          | 11              | saundersi Waterh. " obscura Blkb.              |
| 11          | (Castiarina)    | andersoni L. & G. " variabilis Macl. var. Lea. |
| 11          | 11              | carinata Macl. Clithria albersi Kraatz.        |
| 11          | 11              | cinnamomea Macl. " eucnemis Burm.              |
| 11          | Ħ               | doddi Cart. Trichaulax philippsi Schreib.      |
| 11          | ff              | flavosignata Macl. var. macleayi Kraatz.       |
| 11          | Ħ               | horni Kerr. Glycyphana stolata Fab.            |
| H ·         | 11              | maculiventris Macl. Microvalgus bursariae.     |
|             |                 | var. strandi Obenb.                            |
| 11          | 11              | octospilota L. & G.Family Cerambycidae.        |
| 11          | ff              | sexcavata Deug. Syllitus tuberculatus McKeown. |
| 11          | ff.             | sexplagiata L. &G. Telocera wollastoni White.  |
| H           | H               | vallisii Deug.                                 |

Family Cleridae.
Scrobiger splendidus Newm.

Family Oedemeridae.
Copidita punctatum Macl.

Family Alleculidae.

Chromomea ochracea Cart.

All these species are blossom feeders.

#### Bats' Wing Coral Tree. Erythrina vespertilis Brenth.

#### Family Scarabaeidae.

Anoplognathus parvulus Waterh.

Foliage feeders.

#### Grey or Pale Bloodwood. Eucalyptus polycarpha F. V. M.

#### Family Buprestidae.

Curis carusca Waterh.

Stigmodera (Themognatha) excisicollis Macl. Mimadoretus flavomaculatus Macl.

| 11  | (Castiarina) | alternata Lumh.     |
|-----|--------------|---------------------|
| 11" | 11           | andersoni L. & G.   |
| Ħ   | 11           | atronotata Waterh.  |
| 11  | <b>81</b>    | auricollis Thoms.   |
| 11  | Н            | cinnamomea Macl.    |
| 11  | 11           | erubescens Blkb.    |
| 11  | 11           | horni Kerr.         |
| 11  | 11           | maculiventris Macl  |
|     |              | var. strandi Obenb. |
| 11  | Ħ            | octospilota L. & G. |
| 11  | <b>†1</b>    | triguttata Macl.    |

#### Family Cerambycidae.

Chlorophorus curtisi L. & G.

Aridaeus heros Pasc.

#### Family Scarabaeidae.

Phyllotocus navicularis Blanch.

Hemipharis insularis L. & G. Eupoecila australasiae Don. Polystigma punctata Don.

Cacochroa decorticata Macl.

variabilis Macl. var. Lea Clithria eucnemis Burm. Lyraphora velutina Macl. Glycyphana stolata Fab.

#### Family Cleridae.

Phlogistus sculptus Macl.

smaragdinus Gorh.

Eleale lepida Pasc.

viridicollis Macl. Zenithicola crassus Newm.

#### Family Curculionidae.

Curculio mastersi Pasc.

All these species are blossom feeders.

#### Bloodwood. Eucalyptus gummifera (Gaertn) Hochr. Addenda.

#### Family Buprestidae.

Stigmodera (Themognatha) aestimata Kerr. (Castiarina) andersoni L. & G.

|    | ,    |                    |
|----|------|--------------------|
| Н  | 11   | auricollis Thoms.  |
| ff | 11   | carinata Macl.     |
| 11 | . 11 | cinnamomea Macl    |
| 11 | 11   | decipiens Westw.   |
| 11 | 11   | doddi Cart.        |
| 11 | 11   | flavosignata Macl. |
| H  | 111  | nigriventris Macl. |
| H  | 11   | obsepta Kerr.      |

rubella Cart.

#### Family Scarabaeidae.

Phyllotocus assimilis Macl.

navicularis Blanch,

vittatus Macl. Cheiragra pallida Macl. Dilochrosis balteata Vall.

Eupoecila evanescens Lea. Chlorobapta frontalis Don. Lemosoma tibiale Macl.

Glycyphana pulchra Macl. Mimadoretus flavomaculatus Macl.

Automulus brooksi Brit.

#### Family Cerambycidae.

Tellocera wollastoni White.

Stenellipsis spencei McKeown.

All are blossom feeders except S. spencei McK., which is taken on dying leaves.

#### Cockey Apple. Phanchonia careya (F. Muell) Kunth.

#### Family Buprestidae.

Cyphagastra pistor L. & G.

vulnerate Thery. Foliage feeder.

#### Burdekin Plum. Pleiogynium cerasiferum (F. Muell) Domin.

Family Buprestidae.

Cyphagastra pistor L. & G.

vulnerata Thery.

Chalcotaenia australasiae Saund.

cuprasceus Waterh.

Family Curculionidae.

Peripagis limbatus Pasc.

Orthorrhinus cylindirostris Fab.

Family Cerambycidae.

Typhocesis macleayi Pasc.

These species are either foliage or bark feeders.

Golden-Beard Grass. Chrysopagon fallax S. T. Blake.

Family Buprestidae.
Paracephala aenea Blkb.

Family Chrysomelidae. Rhyparida didyma Fab.

These species feed on the flowers of the grass.

# THE GOLDEN BOWER BIRD.

Australia is noted for its colourful birds and birds with strange habits and calls. One of the most beautiful of these is the Golden Bower Bird (Prionodura newtonia) famed not only for its beauty but also because it belongs to that curious family of bower builders.

The male is a shining gold in colour with brownish wings, side of head and lower back, and, as he flies through the jungle of North Queensland, is a veritable flash of shining golden light. The female is less conspicuous, being an olive green above and light grey below - nevertheless an attractive bird.

The Golden Bower bird is found only in North Queensland, Australia, and there only in jungle country at an altitude of 3000 feet and over.

Other bower building birds are found in Australia and New Guinea and range from those that just clear a space in the jungle floor and decorate this with fresh leaves, to birds that build elaborate play houses and decorate with all manner of objects.

P. newtonia selects a place - generally in the more open type of rainforest - where two small trees or shrubs are fairly close together with a stick or branch connecting the two. He brings many small twigs and sticks and piles them around and between the two upright saplings to a height of three or four feet with the sides elevated a foot or so above the horizontal branch - the "singing stick". Sometimes the shoulders of the bower arch over the singing stick to form a tunnel-like opening. The singing stick is decorated with pieces of grey-green lichen, just about covering it with a mat of material with just a small piece uncovered where he sits to sing. Small white flowers of a particular species are also used, but when some similar artificial flowers were placed near by to tempt him, they were utterly ignored.

The bower may be used by the bird year after year and then suddenly abondoned and a new one built near-by.

When photographs were being taken at the bower, it was noted that Goldie visited it mainly in the early morning, although he did occasionally appear throughout the day. He was not very happy with the hide - or perhaps it was the flash equipment placed near the bower. Several times he came with lichen, always landing

on the same tree at the right of the hide, but not being sure of things, he did not come down but placed the lichen in a hollow tree. He would always approach the bower from the same direction, landing on a nearby perch behind and then hopping on to the singing stick, either to place the lichen or flowers or to sing and display to his mate.

Goldie has a variety of calls. Each time this particular bird arrived from a foraging expedition he gave a call like the twanging of a wire. At other times he gave an ugly croaking noise like a frog but when on the bower he gave a rather pleasant whistle. He also has been known to mimic when displaying.

The birds feed on native fruits and berries. The nest is an open cup made of dead leaves, thin strips of bark, small sticks and moss. This is lined with rootlets and twigs. It is usually found in an opening, ledge or hollow of a tree or other sheltered position in dense scrub and often only a few feet from the ground. There are two pure white eggs. Breeding season is from October to December and this of course is the time that the male redecorates his bower and displays there.

Marion Cassels.

#### ORCHIDACEAE.

# PACHYSTOMA HOLTZEI (F.Muell.) F.Muell.

#### THE GENUS PACHYSTOMA BI. IN AUSTRALIA.

The single member of the genus Pachystoma Bl. found in Australia, P. holtzei (F. Muell.) F. Muell., was found originally in the Northern Territory and described by Ferdinand von Mueller as Eulophia holtzei F. Muell., this name later being corrected to Pachystoma holtzei (F. Muell.) F. Muell. by the same author.

A recent collection of several plants from North Queensland extended the known range of distribution of the species. Collected plants were not in flower at the time, and this single plicate leafed orchid was assumed to be a species of Eulophia R. Br., which it closely resembles vegetatively. Subsequent flowering of plants disclosed it to be a species of Pachystoma Bl., and it was positively identified as P. holtzei (F. Muell.) F. Muell. by Mr. A. W. Dockrill, Lae, who described it as identical to species from the Northern Territory, the original recorded location.

The genus, a member of the subtribe Phaiinae, is a small one of some eight species, found in India, China, through Malaysia to New Guinea, Australia and New Caledonia. The following description of P. holtzei (F. Muell.) F. Muell., in general, is typical of the genus.

Pachystoma holtzei (F. Muell.) F. Muell. Victorian Naturalist 8 (1892) 180. Eulophia holtzei F. Muell. Victorian Nat. 6 (1889) 55.

A terrestrial, sympodial plant with annual subterranear cornlike psuedobulbs. Each psuedobulb is two-lobed, sometimes with an additional side shoot, the lobes growing away from each other, each lobe almost cylindrical, pointed, smooth, almost white. The inflorescence is produced at the extremity of one lobe and the following season's growth at the end of the other.

The new growth develops seasonally. The tip of the previous psuedobulb develops into the new leaf, from the base of which grown the

new psuedubulb. The old psuedobulb withers and by the time of flowering, has gone.

Roots few, from below leaf stem. Leaves one or two, green, with the basal one smaller, sometimes appearing as a bract, Major leaf up to 40 cms. long, narrow, shortly petioled, the blade plicate, sharply pointed, up to about 1 cm. wide. Foliage grass-like and difficult to see in its native habitat, deciduous.

Inflorescence tall, slender up to 40 cms. high, with up to five amplexicable bracts Flowers few, up to eight on the specimens observed, set closely together on the apical portion of the spike. Flower bracts about 8 mms. long, 2 mms. wide, acute, narrow.

Flower pedicel slender, pendulous, 5 to 6 mms. long, barely 1 mm. thick. Ovary large, swollen, to 10 mms. long 4 mms. diameter at middle. Pedicel and ovary finely pubescent with fine white hairs.

Flowers barely opening, apparently self-pollinating. Lateral sepals about 10 mms. long, swollen at base, mantum like about 3 to 4 mms. wide at base and tapering to a point, curved and channelled along length. Dorsal sepal slightly longer, about 12 mms. long and 3 to 4 mms. wide, boat shaped, the apex pointed. Petals almost as long as lateral sepals, narrow, about 1 mm. wide, almost linear but tapering towards the pointed apex, curved.

Column arching, about 8 mms. long, slender, terete, barely 1 mm. diameter, the apex knob-like, about 2 mms. by 2 mms., with short, blunt, rounded column wings about half the height of anther cap. Anther pubescent, dark purple brown, about 1 mm. by 1 mm. Column also pubescent. Pollinia unequal, grouped together, 8 in number.

Rostellum a flat platform, the projecting triangular tip somewhat canaliculate. Stigma a viscid surface, almost square, set between the column wings in the face of the column beneath the rostellum, with the lower lip projecting slightly.

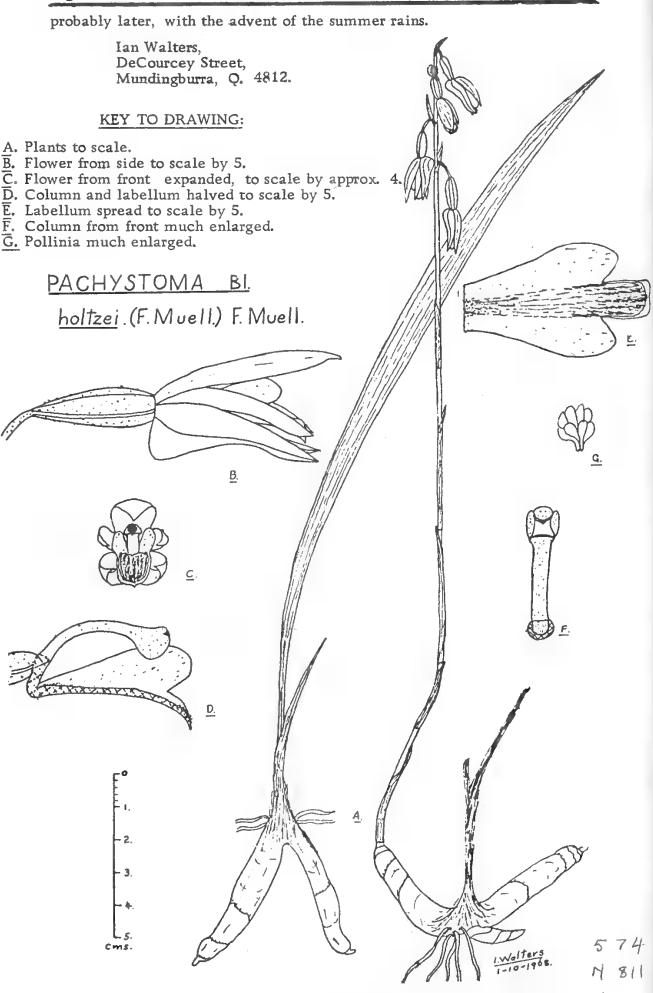
Column with a short column foot, about 1 mm. long, to which is firmly attached the three-lobed labellum. Labellum curved, as long as the petals, the unspread labellum 2 to 3 mms. wide and 10 mms. long. Lateral lobes erect, broad, rounded about 2 to 3 mms. high at broadest point,  $\frac{1}{3}$  length from tip, tapering to base of labellum (which is about 2 mms. wide), and about 10 mms. long. Midlobe almost rectangular when spread, about 4 mms. long and 2 mms. wide.

Disk of labellum with a series of vague lines of papillae extending from almost apex of midlobe to base of labellum, where the papillae are very small and mingled with fine hairs. Papillae largest towards centre line of apex of the midlobe, although the apex of the midlobe is bare, more or less arranged in vague lines decreasing in size of papillae from centre line, with a line of small papillae at base of each lateral lobe.

Labellum is a dull pink purple colour, with the disk being a bright green yellow colour. Sepals and petals also pink purple with some fine minute white hairs on outer surface.

<u>DISTRIBUTION:</u> Northern Territory and North Queensland. In North Queensland found in lowland tea tree swamp at the foot of the Cardwell Range. Because of the grass like nature of the plants and the difficulty in locating plants in long grass, the distribution is probably greater than the small area investigated.

Flowering months apparently September to October. The described plants flowered in cultivation early October, but a trip to the natural habitat failed to reveal plants in flower at that time. Flowering time in the wild is



# THE NORTH QUEENSLAND NATURALIST

CAIRNS
Journal of



# NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO MESSEL

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00.

Junior Members, 50c.

Vol. 36

December, 1969.

No. 150

#### CONTENTS.

| Editorial   | • • • | 2 |
|---|-------|---|
| A Spider That Mimicks the Green Tree Ant - Densey | Clyne | 3 |
| Observations of the Black Butcherbird - J. Moore  |       | 4 |
| Book Review - N. C. Coleman                       | • • • | 5 |
| Pot Pourri - Miss A. Taylor                       |       | 5 |
| Death of A Curlew - K.J.M                         | • • • | 6 |
| Butterflies in New Caledonia - E. B. Skreen       |       | 6 |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers -- September 30, 1969 to September 30, 1970

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

#### EDITORIAL

Another year is ending, dry now and hazard with smoke. However, some most frequently burnt hillsides around Cairns have been spared this year (to date). It is encouraging to think that more people are becoming more consciously careful. The Cairns District Fire Prevention League has achieved the appointment of a Rural Fires Officer to this district, and the regular dry-season burning of coastal ranges, which was so carelessly or so helplessly accepted as inevitable, may yet prove to be almost completely preventable.

Recently formed branches of the Wildlife Preservation Society and the Littoral Society in North Queensland are other welcome signs that more people in the North are becoming actively concerned about the steering, brakes and exhaust fumes of that monstrous vehicle called Development. We wish them well and look forward to co-operating with them wherever interests overlap.

Early this century a market was discovered abroad for koala skins. The slaughter reached a peak in 1924 when more than two million skins were exported, mostly to America. By 1927 this trade, combined with bushfires and expanding settlement, had reduced koala numbers to an estimated 10% of the original in Eastern states, while in South Australia they had been exterminated. Yet a last open season was allowed in Queensland in 1927, during which more than 500,000 koalas were killed, before public opinion forced the Government to pass protection laws. Even then some illegal trade in skins continued until President Hoover in 1930 banned the importation of koala skins into the United States. An epidemic disease has also taken its toll at intervals but, adequately protected from exploitation for money, the koala now seems safe from extinction (barring excessive bushfires and land clearing).

Even the most stringent precautions may leave our Government little time for second thoughts if an "open season" is allowed on the Reef for mineral exploitation. Here many thousands of interdependant forms of life are at stake, all subject to currents, tides winds and cyclones which can never be regulated by Government lease or licence of "limited" areas.

#### A SPIDER THAT MIMICKS THE GREEN TREE ANT

Most residents of North Queensland, and other tropical areas of Australia, are familiar with the Green Tree Ant (Decophylla smaragdina) and with the ingenious way in which a colony of these ants will 'stitch' living leaves together to make a hollow nest in a tree or shrub.

But I wonder how many people - even keen amateur naturalists - have seen the spider (Amyciaea albomaculata) that mimicks it. This little spider has no common name, and the Latin one is quite a mouthful. So, too, is the name I have given it - The Green-Tree-Ant-Mimicking Spider - but perhaps my mouthful can be more readily swallowed!

I first came across these spiders in a paperbark swamp in a Cairns suburb during a night walk with a torch. \*I wasn't looking for anything in particular, and didn't need to. Every leaf and every tree and the spaces between, and the ground, had something to offer. I had something to offer, too - blood! The mosquitos never had it so good - a barelegged female, thin-skinned from a sunless southern winter, at large in their territory. But it was a small price to pay.

Close to a column of Green Tree Ants moving up and down the branch of a prickly shrub, and a foot or so away from them, my torch beam caught what looked like a pair of ants clinging to each other, suspended from a few inches of spider silk. A closer look showed that while one was certainly an ant, the other, instead of having six legs and anthree-segmented body, had eight legs and only two body segments. It was a spider. And it held the quiescent Green Tree Ant firmly in its jaws. I took some close-up flashlight photos and then captured the two specimens.

Having found one spider and 'got my eye in', I located two or three more, all fairly close to ant trails, but never on the actual twig or branch that the ants themselves were using.

The G.T.A.M.Spider (it was too much of a mouthful after all!) is about the same size as the ant it mimicks and apparently preys on. The general colour is a light, translucent green like the ant, though the front segment of the body (the cephalothorax or prosoma) has an orange tinge. The abdomen is green with an irregular pattern of small white spots on top, and, towards the rear, a pair of dark, oval patches.

The first thing you notice is that from behind, because of its pointed abdomen and the dark 'eye' patches, the spider looks like the front end of the ant. But to make assurance doubly sure, it also looks like the ant from in front, because it has a habit of waving the first pair of legs above its head like an insect's antennae! The legs are yellowish and light green, and the first two pairs are much longer than the others.

The physical points of resemblance are noticeable even in a dead spider, but in a living one, besides the habit mentioned above, there are certain behaviour traits that emphasize the mimicry.

For instance, the spider is very active when it is not actually in ambush, and moves with the purposeful brisk jerky motion of a foraging ant. The legs are not laterigrade (flattened and curved forward) like those of many of its close relatives; and it moves forwards not sideways.

When the spider is in ambush, no doubt waiting for a straying ant to come and 'investigate' it as a possible food supply for the colony, it hangs on a short thread of silk by the third pair of legs - upside down, of course. The first two pairs of legs - the long ones - are held stiffly together on either side, at right angles to the spider, each pair bent together in a slight curve.

A spider which is moving about will stop occasionally and go through a sequence of delightful, rhythmical movements with its first four legs. These are raised by a series of jerks until the patellae or knee-joints of each pair almost meet over the spider's back. Then with the same jerking movements they are thrown out sideways, and drawn upwards again, or finally lowered. During the movements, the legs also appear to 'shiver' slightly in a lateral direction.

Although the paired legs on either side move in unison with each other, the two pairs of legs may move slightly out of phase, the second pair reaching their highest point while the first pair is being lowered. The reason for these movements is one of the many mysteries waiting to be solved by some keen field naturalist.

I found seven of these spiders in the swamp, all of them females, and would be interested to know if any member of the Society have been lucky enough to find the males, or have anything to add to my own observations of these interesting spiders.

Densey Clyne.

## **OBSERVATIONS OF THE BLACK BUTCHERBIRD**

The following observations of the Black Butcherbird (Cracticus quoyi) were first made as a boy, exploring an area of dense rainforest near the family home at Smithfield. Butcherbirds were plentiful in this area and many nests were found. The clutch of eggs varied from two to four. Fledglings seen were all brown (although Cayley in "What Bird Is That?" states that both the black and the brown phase often occur in the same brood). Young birds in their first moult were discovered secreting themselves in dense undergrowth in the scrub, always near water; they could not fly very well while moulting for the complete plumage was changed within a fortnight to three weeks. When they emerged from hiding they were fully attired in black.

Many people, quoting Cayley, have disputed these observations. However, wife and friends have now seen for themselves a brown Black Butcherbird change to the black. About two years ago a butcherbird nest with four eggs in it was noticed near the newly

extended Martyn Street cemetry. A few days later, two almost naked nestlings were found on the ground below, covered in green ants. They were taken to two homes and successfully reared on a diet of oatmeal mixed with milk and water, graduating to meat, fruit and insects. Both, when fledged, were brown. When nearly a year old, one bird was fed an obviously sickly grasshopper and within a few hours this bird died - of insecticide poisoning. The other continued to thrive. First sign of its colour change was the appearance of black feathers on the back of its head and back. Other feathers then were rapidly shed and replaced, and within three weeks the change was complete. This handsome black Black Butcherbird continues to be a most companionable pet, and proof to all doubters of some little known facts about its species.

J. Moore, Edge Hill.

### **BOOK REVIEW**

A GUIDE TO AUSTRALIAN SPIDERS, by Densey Clyne. Published by Thomas Nelson Ltd., 403 George Street, Sydney, 2000.

A well illustrated and detailed work on Australian Spiders with keys for the identification of the most common families. The chapter on silk and the spider's way of life is one of absorbing interest, and the details of spider form, colour and mating behaviour, shown in the numerous colour photographs, should help dispel fear and dislike of a most useful order of animals that are always interesting, often beautiful, sometimes bizarre.

N. C. Coleman.

#### POT POURRI

From Miss A. Taylor, now settled at Manganui, New Zealand, has come a leaflet describing Kapiti Island Bird Sanctuary in Cook Strait, just off the west coast of North Island, New Zea-About 1822 Kapiti Island was settled by a Maori tribe who traded with the seven whaling stations established around the island. By 1840, whaling had declined, most of the Maoris had moved to the mainland and farming became the main industry. Before long about half the island was clear of forest. Sheep, cattle, goats, pigs, deer, opossums, cats and rats were introduced. An Act of 1897 restricted the sale of land but farming continued on the Crown Land for many years. However, concerted efforts removed most of the wild animals, rats and opposums remaining. Today Kapiti is a bird sanctuary inhabited by many species which are becoming uncommon on the mainland. Among the forest birds are the kaka, parakeet, tui, bellbird, weka ... Many species of water birds frequent the coast and the Okupe Lagoon. The forests are regenerating. Kanuka stands cover nearly 1500 acres, interspersed with pockets of kohekohe forest on rocky ground. Some time in the past fire swept the whole island. The old forest it destroyed contained many large rata trees, mostly terrestrial, forms only a minor part of the present forest but rata flowers are still an important food source for the nectar feeding birds. Tawa stands are not very extensive but will increase as the

vegetation becomes older.

Quoted freely from leaflet prepared by A. E. Esler for Dept. of Lands and Survey, Wellington, 1967.

----000----

# DEATH OF A CURLEW

Today in an Edge Hill garden a curlew died - a slow painful |death, presumably caused by pesticide poisoning. Primary Industries Department officer advised that, because of their residual properties the use of D.D.T. and similar insecticides is now banned on poultry farms, but they may still be used elsewhere. If large numbers of birds in an area were dying, his Department would then investigate to find the cause. However the death of one curlew was not of serious interest.

K.J.M.

#### BUTTERFLIES IN NEW CALEDONIA

The island of New Caledonia is about 250 miles long and 30 miles wide with a chain of forest-clad mountains dividing it in two halves: West and East. The northern part of the West consists mostly of grassy hills used for cattle breeding, wwhile the southern part is almost barren with one of the world's biggest nickel deposits. The coast has hundreds of deeply cut bays and small islands. The Eastern half, covered by dense rain forest with Sumatra deer and wild pigs, is cut by numerous rivers and lagoons and edged with gleaming white coral beaches. Coral reefs encircle the whole island, so there is no surf,, but an abundance of fish of many kinds. The temperature is about 80° all year round.

New Caledonians are Melanesian, friendly and easy-going. The majority still continue their tribal life in small villages on the jungle-clad East coast, with the local chief as authority. The work force necessary for the nickel mines had to be brought from abroad, mainly from New Hebrides and Indonesia. But there is no racial problem, as all consider themselves French and freely mix together. Life, even in Noumea, is leisurely, with three hours of siesta from 11 to 2, during which shops are closed and streets empty. Bars, cafes and small shops are open every night and on Sundays as the custom requires.

The major part of any New Caledonian forest consists of bush-like "Niaouli" trees, Melaleuca leucadendron, which belongs to the Eucalypt family but looks more like a mimosa. Lantana is the next most prevalent plant. The rainforest includes banians and fern trees, with the Cocos palm on the sea shore. Much of the jungle is now being cut for coffee plantations.

About 60 miles south of Noumea is the beautiful Island

of Pines, owing its name to the abundant tall pines, Araucaria columnaria.

I had been told that there were few butterflies in New Caledonia, so arranged my trip as a tourist. Therefore my hunting was limited to a few days on the East Coast, to the vicinity of Noumea and to the Island of Pines. Here I found certain species in astonishing numbers.

The number of New Caledonian Rhopalocera is supposed to be 47, but I found a few species which have not been listed. There are 14 species considered local; the others are migrants which settled on the island centuries ago. Of these, 20 come from Indo-Malayan region, i.e. New Guinea and Indonesia; 10 come from Australia; 1, Borbo cinnara, a Hesperid, from Formosa; 1, Pieris rapae, from Europe; and Danaus plexippus is a cosmopolitan. They are distributed as follows:

- a. PAPILIONIDAE 3 species: Papilio gelon, local; P. iloneus amyntha, a variation of the Australian P. fuscus; and P. montrouzieri, a variation of Australian P. ulysses. These are found at Noumea and the Island of Pines. P. montrouzieri, a very variable species with different width of the black band, is the most common and isl also found on the East Coast.
- b. PIERIDAE 14 species: 4, local; 6, Indo-Malayan; 3, Australian; 1, European. Two Delias, D. nysa and D. elipsis, found on central mountains, are both supposed to be Australian. D. nysa is, but I do not know any D. elipsis in Australia. Most of the Pieridae are found at Noumea and Island of Pines. The commonest one is Anapheis java Indo-Malayan, not Australian type; it is quite common on the East Coast, even more at Noumea, and in Hundreds on Island of Pines. There are found, also, Appias, Cepora and Catopsilia. Elodinas are found both on East Coast and Island of Pines. The only yellow one, Terias (Eurema) hacabe, is found everywhere.
- c. DANAIDAE 8 species: 2 local; 2, Indo-Malayan; 3, Australian; 1, cosmopolitan. Of four Danaus, D. neomelissa, Indo-Malayan, is confined to the Central Chain; and D. plexippus, cosmopolitan, D. cryssipus, Australian, and D. pumila, local, are found at Noumea and Island of Pines. Of four Euploea, E. boisduvalii and E. tulliolus, both Australian, are found on East Coast; E. helcyta and E. schmeltzi, both local, on Island of Pines.
- d. NYMPHALIDAE 10 species: 2, local; 6, Indo-Malayan; 2, Australian. The two Australian, Accrea andromacha and Precis villida, are found in hundreds on Island of Pines; few Precis have been seen at Noumea. Atella sinha and Hypolimnas bolina, both Indo-Malayan, have been seen only on Island of Pines. The female of H. bolina is even more variable than in Australia: at least six different forms have been listed. Also on the Island I found a species of Cyrestis, Indo-Malayan, which is not listed anywhere. The other five H. alimena and H. octocula, Doleshallia bisaltide, Polyura clitarchus and Libythea geoffroyi, are found mostly on the Central mountains.

- e. SATYRIDAE 2 species: 1, local; 1, Indo-Malayan. Both Paratisiphone lyrnessa (local) and Melanitis leda have been found only on the East Coast and seem to be scarce.
- f. LYCAENIDAE 6 species: 2, local; 4, Indo-Malayan. Two Thysonotis caledonica and Chilades cleota exellens, both local, are found on the Central mountains. Lampides boeticus, Catochrysops strabo, Eucrysops cneyus and Zizeria otis are found around Noumea.
- g. HESPERIIDAE 4 species: 2, local: 1, Indo-Malayan; 1, Formosan. Two local species, Hasora khoda and Badamia atrox, are found around Noumea and on Island of Pines. Borbo impar (Indo-Malayan) and B. cinnara (Formosan) are found on the Central mountains.

There is no record of any kind on the Heterocera of New Caledonia and I saw very few of them. A couple (one Ophideris) were caught on the East Coast, and two Sphingidae, Teretra nessus and, probably, Psilogramma, on Island of Pines.

The most spectacular specimen I acquired was, without doubt, a Giant Grass hopper of the Island of Pines. I saw one flying across a road, but then could not find it. Another was reported falling into the sea. Then on my last evening, the manager of the guest house where I was staying brought me one which attracted by light, flew into his bungalow. It was a monster with a wingspan of almost ten inches.

E. B. Skreen, Bondi.

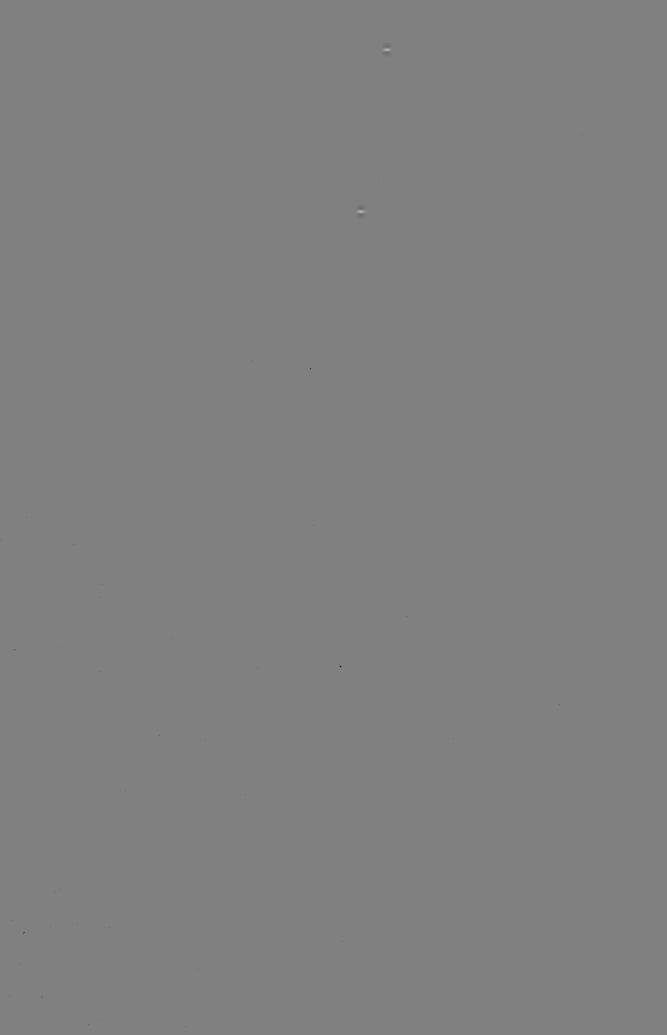
The following Xeroxed journals are for sale.

For \$20.00: 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, Vol. 2 1-12. 25-36, 37-48, 49-83, 103, 106 and 109. 1 SET ONLY Singles @ 80c per copy: 5, 6, 37, 51, and 106. 1 SET ONLY 2 @ \$1.00: 50-51 and 4 @ \$2.00: 79-83. 1 SET ONLY

#### SPECIALIST ADVISORY PANEL

| Botany           |   |       |       | Dr. Leonard J. Brass, D. Sc.        |
|------------------|---|-------|-------|-------------------------------------|
| Biology - Genera | 1 |       |       | Mrs. J. Wright, M.A., B.Sc.         |
|                  |   |       |       | Mrs. A. J. Read                     |
| Entomology       |   | Mr. 1 | N. C. | Coleman and Mr. G. Brooks, F.R.E.S. |
| Herpetology      |   |       |       | Mr. Chas. Tanner                    |
|                  |   |       |       | Mr. G. Priestly                     |
| Marine Biology   |   |       | • • • | Mr. A. A. Read                      |
| Minerology       |   |       |       | Mr. K. Collins                      |
|                  |   |       |       | Mrs. J. Cassels, Mr. J. Bravery     |
| Orchidology      |   |       |       | Mr. A. W. Dockrill, Mr. J. Berry    |





# THE NORTH QUEENSLAND NATURALIST NATURALIST NONAL MUSICUE

CAIRNS

Journal of



# MORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. 19100 PLYSTE.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS - Box 991, P.O. CAIRNS.

Q. 4870, Australia.

Phone 53 1829.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 37

March, 1970.

No. 151

#### CONTENTS

| Book Review A. Dockrill                              | <br>. 2 |
|--|---------|
| Trinity Bay Jack Cassels                             | <br>. 3 |
| Do Giant Clams eat Starfish Eggs? K. J. Morris       | <br>. 4 |
| Colour Change of Black Butcher Birds Marion Cassels  | <br>. 4 |
| Another Australian Novelty L. R. Richardson          |         |
| New Bird for Cairns? Marion Cassels                  | <br>. 5 |
| Another Predator on the Cane Toad (Bufo marinus)     | <br>. 6 |
| An Amazing Beetle from New Guinea Phillip H. Coleman | <br>. 6 |
| Record of a Migration of a Chequered Swallowtail     | <br>. 8 |
|  |         |

"Each Author is responsible for the opinions and facts expressed in his or her article".

Club Officers -- September 30, 1969 to September 30, 1970.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

#### **BOOK REVIEW**

"ORCHIDS IN AUSTRALIA"

The long-awaited complete works of the late W. H. Nicholls have been reproduced in one volume by the Publishing firm Thomas Nelson of Melbourne under the title of "Orchids of Australia". This is a large volume with the sheets 13 x 10 inches and comprising 129 pages of descriptions and 476 pages of illustrations in full colour. It is unquestionably the most significant or at least as significant as any contribution to Australian orchidology this century and will undoubtedly remain an important reference work on Australian orchids for all time. One wonders how a man in a short lifetime could produce so much in such detail and it is a matter of the deepest regret that the author did not live to see his complete works published (he died in 1951).

The descriptions are excellent and the illustrations magnificent, giving, for the most part, a flowering plant in natural size and natural colour and enlargements in detail of some of the important parts of the flower. One must also compliment D. L. Jones and T. B. Muir for their excellent editing. Their task of arranging in an orderly fashion all of Nicholls' works and checking the nomenclature and bringing it up to date must have, indeed, been very onerous. Compliments are also due to the publishers who have been able to produce such a volume to retail at 30 dollars.

Being such an excellent work, one is loth to be at all critical but as a reviewer, one is duty bound to point out a few of the shortcomings. The work is entitled "Orchids of Australia" which is apt to give the impression that the work covers all the orchids of Australia but this is not the case; as one instance, a single species of Habenaria is described and illustrated, whereas about 15 occur in Australia. It would have greatly enhanced the value of the volume if at least mention had been made of those Australian species not described and illustrated in the work. In the editors' introduction, one is assured that the arrangement of the genera is basically (with a few minor modifications) that of Pfitzer in Naturlichen Pflanzenfamilien ii, 6 (1889). However on going through the text one is not always sure of the affinities of each genus as no indication is given of where a group begins and ends, and unless the reader has a copy of the relevant volume of Naturlichen Pflanzenfamilien, which the average reader certainly would not possess, he is often left guessing. There are two small criticisms that could be levelled at the publishers: a few of the reproductions of the illustrations are blurred and the binding looks rather fragile for such a volume that will be used repeatedly for many years.

One is very hesitant to say anything about the author's work as the general standard is very high. However, the colour, in some instances, seems to be slightly garish. Longitudinal sections of the labellum and column in some of the genera, particularly those of the subtribe Sarcanthinae, would have greatly assisted the average reader in gaining an understanding of the distinguishing features of a particular genus. Keys to the species of the various genera would have greatly enhanced the usefulness of the book but their absence is understandable when one realises that the author did not live to complete his task.

A. Dockrill.

#### TRINITY BAY

A brief discussion on its mudflats, mangroves and swamps.

Cairns is a growing city situated on Trinity Bay. Visitors seeing for the first time the mudflats and mangroves which comprise our foreshores and the swamps in the middle of the city, may be excused a disparaging remark or two, particularly if they have been expecting coral sands and bikini clad girls so popular with writers of tourist literature. Yet these same mangroves, mudflats and swamps - or wetlands as they are called - both in Trinity Bay and elsewhere round the coast of Queensland will play an important part in our country's ability to feed an ever increasing population.

It has long been recognised that these wetlands serve as developing grounds or nurseries for prawns and shelter and feed many juvenile and adult species of estuarine and coastal fishes (barramundi is one) together with many other marine creatures such as crabs, oysters, eels etc. There is an abundant supply of food available to them either growing amongst the mangroves and sea grasses or on the mudflats and this is added to daily by plankton brought in from the sea by the tides. Visual evidence of this is the tremendous numbers of crabs, mudskippers, etc. that can be seen on the mudflats and the thousands of wading birds that feed on them for many months of each year.

As the prawning industry of North Queensland is potentially a big one, and therefore important to the economy of Queensland as a whole and Cairns in particular, it may be in order at this stage to make a brief mention of the life cycle of the commercial prawn.

Spawned in the deeper waters off the coast, the eggs hatch and the young prawns in their millions gravitate to the upper layers of the sea where they become part of the food chain of fishes and other marine animals. Being free swimming and helped by favourable winds and currents, the survivors move into the coast and find some shelter from predators among the mangroves, up the river estuaries and in the swamps that connect with the sea. Here they spend the greater part of their lives feeding and developing and in the course of doing so many become prey for the fishes in this habitat. When fully grown and with the appropriate season and conditions they move out to deeper waters where mainly they are caught and become food for man.

As well as the Barron River, many small creeks flow into Trinity Bay and the total length of mangrove fringed shoreline up these estuaries and around Admiralty Island is considerable. They must maintain a tremendous marine population whose withdrawal for any reason would have considerable impact on the total number of prawns taken each season by trawlers, with a similar effect on the catch of coastal and estuarine fishes.

These wetlands have been in existence for many years but that is no guarantee that they will continue for a similar period in the future. They and their inhabitants are very vulnerable to pollution in whatever form it may take, be it harmful effluent from factories, city drains or sewer, excessive silt from dredging, pesticides carried by streams into the bay, from a major spill from an oil tanker or reef drilling, or other causes. Reclamation for industry and housing and also the draining of swamps has its effect in reducing the total area of these wetlands so

that serious thought must be given to their preservation. Otherwise the contribution they now make to the total food supply available for man's consumption would be curtailed.

Jack Cassels.

## **UO GIANT CLAMS EAT STARFISH EGGS?**

Conservation of the Great Barrier Reef is a matter on which widely varying opinions continue to be expressed. What has emerged most clearly is the inadequate state of our knowledge of reef life as a whole.

Mr. Doug. Scullett of Port Douglas was one of those who aroused public concern at the harvesting of giant clams (Tridacna sp.) also other fauna, from the Reef by Chinese fishermen. A letter from Mr. Scullett says, in part: "Re. the growth of giant clams, very little research has been done on this bivalve. From personal observations, I believe the initial growth from spawn to about one foot is rather rapid, say two to three years, then the rate decreases to nil eventually. I know of a few shells about two feet that have made no apparent change in size over fifteen years. It follows that the shells the poachers were harvesting about three feet and upwards - would take at least fifty years to grow.

"It is noticeable that the quantity ratio between giant clams and horse-shoe clams (Hippopus hippopus) on any reef is about 100 to 1 in favour of the horse-choe clam. ... Some of our larger fish predate on the horse-shoe clam. Thus the reproduction rate of the giant clam on the reefs that have been pirated will be extremely slow and probably take centuries to get back to normal".

Could the depletion of giant clams on large areas of reef over a period of years have contributed to the build-up, during these same years, of the Crown of Thorn starfish plague?

K. J. Morris.

### COLOUR CHANGE OF BLACK BUTCHER BIRDS

In the December 1969 issue of the journal, Mr. J. Moore tells of a Black Butcher bird, brown phase, changing its colour to black. I have had numerous butcher birds of both colour phases in my garden and have never seen this change. However, on Feb. 24th 1970 a bird came into the garden in a peculiar mottled state, obviously in the middle of its colour change. It was more black than brown, but still had numerous areas of brown feathering. I am therefore able to confirm Mr. Moore's observations on this little known fact.

Marion Cassels. Edge Hill 1970.

#### ANOTHER AUSTRALIAN NOVELTY

In various parts of east coastal Australia, it is not unusual following rain to find on concrete paths, long, narrow, flat, green, brown or grey, slow-moving worms which are very sticky to the tough and most difficult to pick up. These are land-planarians, They range up to five or six inches, and longer, and extended fully may be less, than a quarter of an inch in width. They are similar to freshwater, marine and parasitic flat-worms (such as the fluke), and zoolog-ically curious since without any important obvious distinctive change, they possess the ability to live on land, in damp places such as in forest litter, under fallen bark, under stones, and similar shelter.

In such a place, the members of the North Queensland Naturalist's Club found a flat worm about  $2\frac{1}{2}$  inches long, just under  $\frac{1}{2}$ inch wide, handsomely chocolate-brown above, nearly white below, and sticky. The latter the sign of an animal which moves on a slime trail, as do the slugs and snails.

Received, it was obvious on sight that this was a land-planarian; but as has been my experience with other of the lesser Australian animals, it quickly proved itself to be typically Australian. It was entirely unfamiliar with the rules and etiquette of being an ordinary land-planarian.

It moved rapidly. Worse! It could and did in an entirely improper unplanarian manner, raise the anterior third of the body high off the ground, extend and move this rapidly from side to side, gently touch only the tip down to the ground, lower the whole to the ground and raise it again; and repeat this to a degree which ordinary planarians do not do.

With this behaviour, it rapidly persuaded me I was in error in thinking it only a land-planarian. Searching all the other possibilities, excluding one after the other, left only that it is indeed an astonishingly different kind of land-planarian, another of the amazingly novel animals of the Australian fauna, a matter which nobody could recognize who knew it only as a preserved specimen in a bottle.

It can only be hoped that the Club will again be fortunate, find more specimens which will provide the opportunity for the further desirable observations on the live animal.

L. R. Richardson.

## POT POURRI

#### **NEW BIED FOR CAIRNS?**

In February 1969 I was driving down the Esplanade, Cairns, when I noticed a large bird on the tidal flats that I had not seen before. It was standing beside some Silver Gulls (Larus novae-hollandiae) and was more than twice the size of them. It had a heavy black bill, hooked and tipped with white; the tail was wedged, white with a black edge; the body and wings were nottled brown and buff and there were slight striations down the side of the neck and shoulders; the underparts were whitish and a dark line extended back from the eye; short black legs and black feet; there was a faint brownish ring around the head. I could not identify this bird myself

so sent the description to Mr. Keith Hindwood who told me it was either a juvenile Dominican Gull (L.dominican) or Pacific Gull (L. pacifica). The bird was seen by various other bird watchers namely Mr. Noel Jack of Brisbane, Mr. Len Robinson of Melbourne and Mr. Ellis McNamara of Mt. Kembla. Now in November 1969 the bird is in just about full adult plumage and Mr. Len Robinson who was visiting Cairns at this time positively identified it as a Dominican Gull. I have not seen any record of this bird being found in this area before. My thanks to these gentlemen for confirming the presence of this bird and identifying it for me.

Marion Cassels.

# ANOTHER PREDATOR ON THE CANE TOAD (BUFO MARINUS)

At Yorkeys Knob in the garden of Dr. S. Watsford, a female Koel is a regular visitor and has become so tame that she will eat food thrown down at Dr. Watsford's feet. One day he was working at a garden table made from slatted wood, when the Koel flew down with a small cane toad, wedged it tightly in the slats of the table, then ripped the toad open and eviscerated it. Having enjoyed her meal she flew away and came back with another one which she proceeded to deal with in the same manner. She repeated this another twice before being satisfied.

Marion Cassels as told by Dr. Watsford.

-000 -

## AN AMAZING BEETLE FROM NEW GUINEA

Phillip H. Colman Department of Molluscs. Australian Museum

For two years until recently I was a Field Associate in Entomology for the Bernice Bishop Museum of Honolulu, and my stamping ground was New Guinea. The Bishop Museum, under Dr. J. Linsley Gressitt as Director of the Entomological Department, has had a continuing programme of entomological research in the Pacific, and a large part of this has been centred in New Guinea. Although the final aim is to collect and describe all insects from these areas, certain groups have been particularly sought after and are being written up at present in the Bishop Museum journal "Pacific Insects". So, Dr. Gressitt has published considerably on the beetle family Crysomelidae, and the Hispinae, Mr. A. Samuelson has documented the Alticinae, or flea beetles, and Mr. J. Sedlacek is at present working on the Lycidae. One particular group, the genus Gymnopholus of the Curculionidae or weevils, has proved of extraordinary interest, and the following general account is designed to show why.

Gymnopholus, a genus of large weevils endemic to New Guinea, has to date about 60 known species. Size ranges from about three quarters of an inch to one and one half inches, and all species occur in the medium to high altitudes, from about 800 to 3000 metres. They are slow moving insects with tused elytra, so that the only method of locomotion is by walking. They

are sexually dimorphic. The type of the genus is G. weiskei Heller, a medium altitude species slightly larger than an inch in length and a polished black. It is quite a common insect in certain areas. Some other members of Gymnopholus s.s. are more brightly coloured, black with brick red spots on the elytra or irridescent greenish scales in places.

However, Gressitt erected the subgenus Symbiopholus to incorporate certain higher altitude species, including some of extra-ordinary interest in that they show a symbiotic relationship with an amazing array of cryptogamic plants such as lichens, algae, etc. which grow on their backs. Even more amazing, certain other small animals, mites, nematodes and rotifers have been found within this "garden". These species show a special modification of the dorsal surfaces, of depressions and grooves between the rugae, to encourage the establishment, growth and protection of these plants. It appears also that the weevil excretes a secretion to encourage this plant growth.

So far about 15 families of plants have been associated with this epizoic symbiosis. They include lichens (2 families), liverwarts, algae (5 families) and fungi. I have collected specimens covered with lichens, with lichen 'fronds' up to half an inch in length. Within this garden a new oribatid mite, a very small black species representing a new family, has been found living in the fungal growths. Also nematodes and rotifers have been found.

The beetles live on woody plants of various genera in high altitude moss forests where humidity is high and temperatures fairly moderate. They can walk considerable distances at times. Experiments we carried out to attempt to determine how long they lived involved marking of specimens (of G.(S), lichenifer Gressitt) with bright paints and releasing them, and then keeping frequent tabs on movements. Some specimens walked several hundred yards in a matter of weeks, a considerable distance. Age has yet to be determined, though it has been estimated by some botanists that up to five years would be necessary to allow for the plant growths on some individuals.

It might be interesting to point out here that certain other insects have been recorded as having a symbiotic relationship with plants, though only one other genus Pantorhytes, has an association with animals as well. The desert locust of India, Schistocerca gregaria Forsk has been recorded with algal growth on wings; some beetles in New Guinea have, at times, a spectacular growth of algae and lichens - various higher altitude species within the genus Pantorhytes (which includes the low altitude and great pests of cocoa, P. szentivanyi Marshall and P. platus Oberthur); a new species of Colydiid beetle Dryptops phytophorus Samuelson; and various genera of the Papuan Cryptorrhynchinae.

For further reading the following are recommended.

Gressitt, J. L.

Epizoic Symbiosis: The papuan Weevil Genus Gymnopholus (Leptopiinae) Symbiotic with Cryptogamic Plants, Oribatid Mites,

Rotifers and Nematodes.

Aoki, Jun-Ichi.

Pacific Insects 8 (1):221-280, May 10, 1966. An Oribatid mite, Symbioribates papuensis representing a new family, from cryptogamic plants growing on backs of Papuan weevils (Acari: Cryptostigmata). ibid, 281-289.

A new Papuan Colydiid beetle with epicuti-Samuelson, G. A. cular growth of cryptogamic plants (Celeoptera: Colydiidae, ibid, 290-293 Cryptogamic plants growing on various Gressitt, J. L. weevils and on a colydiid beetle in New Guinea. ibid 294-297. The weevil genus Pantorhytes (Coleptera) involving Cacoa pests and epizoic symbiosis with cryptogamic plants and microfauna. do, 8(4): 915-965, Dec. 20, 1966. ----- and Sedlacek, J. Papuan weevil genus Gymnopholus: suppliment and further studies in epizoic symbiosis. do, 9(3): 481-500. 20 August, 1967.

#### **ERRATUM:**

In the December, 1969 issue, "Pot Pourri", describing forest of Kapiti Island, a line was omitted. Passage should read: "... The old forest (the fire) destroyed contained many large rata trees which began their lives perched on other trees. The new generation of rata trees (are) mostly terrestrial..."

# RECORD OF A MIGRATION OF THE CHEQUERED SWALLOWTAIL

(Papilio demoleus sthenelus Macleay (Lepidoptera: Papilionidae)

By C. N. Smithers and I. B. McArtney

(Australian Museum, Sydney and C/- Post Office, Mt. Isa).

There do not appear to be any detailed references in the literature to Papilio demoleus sthenelus Macleay as a migrant.

Alexander (1917) mentions it as accompanying "enormous numbers of the butterfly Danaida chrysippus petilia" in south-west Australia in the summer of 1914-15. This is referred to as "migration" but there are no details of direction nor areas.

Barrett and Burns (1951) refer to it as being rare in southern Victoria and South Australia "and seen during only certain seasons when it then appears sporadically and usually flying fast in one direction". Details are not given.

On the 13th May, 1969, hundreds of specimens were observed by one of us (I. B. McA.) flying against a headwind in a south easterly direction on and across the Stuart Highway over a length of fifteen miles between Elliott and Renner Springs, Northern Territory.

This observation appears to be first in which direction and time of year have been recorded and establishes beyond doubt that the species is a migrant at certain times of the year.

-000-

#### REFERENCES.

Alexander, W.B., 1917.

Barrett, C., and Burns, A. N. 1951. White winged black terns in Western Australia: a remarkable visitation. Emu 17: 95-100.

Butterflies of Australia and New Guinea.

Melbourne. i-x, 187 pp., 14 figs., 18 pls. (cf. p. 25)

# THE NORTH QUEENSLAND NATURALIST

# CAIRNS Journal of



# NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presa. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS - Box 991, P.O. CAIRNS.

Q. 4870, Australia.

Phone 53 1829.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St. 8p. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post".

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 37.

June, 1970.

No. 152.

#### CONTENTS.

| Bone Deposits in Chillagoe Mung | gana Cav | res. Jo | Trezise . |       |         | 2 |
|---------------------------------|----------|---------|-----------|-------|---------|---|
| Peripatus A Biological Enigma.  | Robert   | Hardie  | • • • •   | • • • | • • •   | 4 |
| Is there a Queensland Marsupial | Tiger?   | Janeice | Plunkett  |       | • • • - | 6 |

"Each Author is responsible for the opinions and facts expressed in his article".

Club Officers -- September 30, 1969 to September 30. 1970.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. G. AYRES.

Editor: Miss J. MORRIS.

## BONE DEPOSITS IN CHILLAGOE-MUNGANA CAVES

The recent discovery of extinct marsupial bones in cave deposits of the Chillagoe-Mungana limestone series has again highlighted the rich potential of this interesting but so far little investigated area. Deposits of animal bones occurring in limestone caves can provide a valuable clue to past and present inhabitants of the limestones and surrounding country. Not only are the usual dwellers of the limestone bluffs represented in bone collections from caves, but also those that have died after inadvertently falling, and some whose bones have been washed in from outside.

The high rate of decomposition of animal matter in the dry tropics and the ravages of predators ensure that surface bone deterioration is rapid. Yet in the caves both temperature and humidity remain surprisingly constant, considering the extremes reached outside, throughout summer and winter, Wet and Dry, day and night. In this stable environment, aided by the preservative qualities of the limestones and carbonate-impregnated soil, bones may remain in a remarkably good state of preservation over long periods of time.

This may make their age at times difficult to determine, particularly where they do not occur in stratified deposits, as happened with the thylacine discovered in October 1966 in a cave (now known as Thylacine Hole) on the Nullabor, 68 miles west of Eucla. Age estimates for this animal, which still retained some body parts such as hair and skin, ranged variously from 1 to 2,000 years!

The belt of limestone comprising the Chillagoe-Mungana series, with which this article is concerned, has not yet produced such an important find as that on the Nullabor, but possibilities of comparative finds certainly exist.

Nevertheless, random collections of bone remains have already resulted in some interesting finds. These include new records for the area, as well as some of animals which are believed to have disappeared following the early intensive settlement of the district for mining purposes.

A wide field of research still remains open into the collection, dating and classification of bone deposits and bone breccia, and in the

investigation of bone and skeletal remains in secondary floor deposits of limestone.

A rough classification of bones so far collected from caves in the Chillagoe-Mungana area, and for the most part identified by the Queensland Museum, yields the following groups:-

Mammals, mostly eutherian and marsupial mammals. Aves.
Reptilia.

Of these the mammals form the largest and most diverse group. Many of the larger mammals lie up in cave shelters during the heat of the day. Others, as in the case of the dingo, may also bring prey to be consumed there. Some venture right into the cave system or make their way in and out over debris left by collapsed roofs. In one case a whole litter of young piglets was found together with the mother in a cave where they had died after falling in and being unable to escape. In another case, a friend investigating a shelter on the side of a bluff was suddenly startled to find an equally startled wallaby land in his arms on its hurried departure from the shelter.

Apart from pigs and the dingo (Canis dingo), larger mammal bones include the wallaroo (Macropus robustus), brush-tailed rock-wallaby (Petrogale penicillata), red-legged pademelon (Thylogale stigmatica), and indeterminate wallaby remains, probably including those of the sandy wallaby (Wallabia agilis).

Smaller mammals live around the bluffs or in the caves where the many holes and crevices afford them shelter from both humans and predators. On the dusty floors of many caves their tracks criss-cross one another, but they are seldom seen by unwary humans. However after death their skeletal remains are left behind, or washed into cave deposits through many openings from above. Jawbones and teeth are the most important parts used by the naturalist in their identification.

This group includes Rattus sp., marsupial mice (Sminthopsis sp.), short-nosed bandicoot (Isoodon macrurus), giant naked-tailed rat (Uromys sherrini), northern native cat (Satanellus hallucatus), sugar glider (Petaurus breviceps), black-tailed phascogale (Phascogale tapoatafa), the last not previously recorded from this district.

Bats form an interesting-some would say fascinating -subgroup within the mammalian cave fauna. The extent and variety of caves within the optimum climatic conditions and the comparative isolation and freedom from interference, tend to encourage a large and varied bat population. A number of species are believed to occur not only in the caves but in the surrounding open forest country, but so far only limited research has been carried out. The very factors which encourage large bat populations - isolation and distance from large human centres of population - discourage their long-term intensive study by naturalists.

Bat remains so far identified include white striped mastiff bat (Tadarida australia), false vampire bat (Macroderma gigas), freetail bat (Saccolaimus sp.), North Queensland long-eared bat (Nyctophilus bifax.) little bent-wing (Miniopterus australia) known to breed in the district, horseshoe bat (Rhinolophus philippinensis) and little brown bat. This last, together with Nyctophilus bifax, were collected outside the caves and are not necessarily cave-dwellers.

Bird remains are sometimes found in the caves although their fragility makes them less durable than bones of mammals. The barn owl (Tyto alba) and

boobook owl (Ninox boobook) have been identified, and the grey swiftlet (Collacalia francica) nests high on cave walls in many large colonies. Although Peregrine falcon and nankeen kestrel are known to nest in and around the bluffs, only one diurnal bird of prey has so far been found actually living within the caves. This was a small hawk discovered by the Cassels family inhabiting a ledge high up near the entrance to the Royal Arch caves. Bone remains from the meals of this bird were later identified as mostly Rattus sp. with some remains of the long-nosed bandicoot (Perameles nasuta).

Among the reptiles, bones of blue-tongue lizards (Tiliqua scincoides) including complete skeletons, are most often found. The blue-tongues frequent the bluffs and open chambers, and sometimes fall victim to the bottles of water left under dripping stalactites and used for carbide lights.

The brown tree snake (Boiga sp. ) and carpet snake (Morelia sp. ) have also been recorded from in and around the bluffs.

This account is by no means definitive. It is no more than a summary of random collections and observations made of the vertebrate dwellers in the Mungana-Chillagoe limestone area, from the record left by their skeletal remains. The work in this fascinating and almost untouched field has hardly begun.

JO TREZISE.

## PERIPATUS - A BIOLOGICAL ENIGMA.

Of the many biological oddities discovered in the early 1800's, few have shared the interest aroused by the Peripatids. From fossil evidence it appears that the group has remained almost unchanged since the Cambrian, about five hundred and fifty million years ago. This, coupled with a unique combination of anatomical characters, suggests that Peripatus, or a very close relative, could have played an important role in the evolution of the Annelid worms and the myriapoduos Arthropods. Thus, Peripatus has gained popularity as both a "living fossil" and a "missing link".

The Reverend Lansdowne Guilding collected the first recorded specimens in the West Indies in 1825 and, upon observing the strangely meandering gait of this small animal, named it Peripatus (Greek: PERIPATOS wandering about). Guilding included his new find in the Phylum Mollusca because of its slug like appearance and coarsely textured skin; he ignored the presence of a number of pairs of legs. Understandably there was soon some dispute over the correct classification of Peripatus. Finally, after a varied career as a Mollusc, a Platyhelminth, an Annelid and a Myriaped, Peripatus was given a class of its own Class Onychophora, generally included as an appendix to the Arthropoda. The Class Onychophora was later elevated to Phylum level and at present includes a number of related genera and some seventy species.

Anyone acquainted with Peripatus will appreciate the difficulties involved in precisely designating the animal to any previously established taxon. Externally, the body is elongate, superficially segmented and has a soft, velvety skin. The skin is flexible, and on close examination is covered by small papillae. Apart from the latter, these are all Annelid features. The anterior antennae, pair of simple eyes, mouth with two pairs of chitinous jaws, segmental arrangement of the legs and a pair of terminal claws on each leg are essentially Arthropod features. Internally, Peripatus has an Arthropod blood system, heart, body cavity and

respiratory system. On the other hand, the metameric (serially repeated) arrangement of certain internal structures is more Annelid than Arthropod, and is strong evidence supporting the overall primitive nature of Peripatus.

The Peripatids reproduce sexually, having distinct male and female individuals. Adult size varies according to species, but usually the male is smaller than the female. An extended adult male ranges from sixteen to seventy millimeters in length, while an adult female may attain a length on one hundred and twenty millimeters or more.

Although there are no recorded observations of sperm transference, three possible methods have been suggested. Firstly, small packets of sperm (spermatophores) are deposited by the male on the body of the female. The sperm then penetrate the skin and make their way to the oviducts and fertilize the eggs. Secondly, the spermatophores are deposited near the female and she picks them up herself. Thirdly, the spermatophores are deposited directly into the female genital aperture.

Following fertilization, embryonic development may take as long as eight months in some species. At the end of gestation, up to twenty live young are produced over a period of a few days or even weeks. At birth, the young resemble adults in miniature but are almost translucent; pigmentation takes from four to ten days. At least two Australian species do not bear live young, but lay large, sculptured eggs. The eggs lie in the soil or leaf litter until they hatch. On an average the young are five millimeters in length at birth and, at a growth rate of around one millimeter per month, reach sexual maturity in two years or so. They may remain with the female parent for the first few weeks of life.

Peripatids occur over a range of environmental situations, but limit ations on distribution are probably set by the amount of free water in the surface soil layers, together with humidity. Peripatids cannot prevent vital body water from evaporating through the small respiratory openings (tracheal pits) in the skin, and if exposed to dry conditions for only a short period of time, quickly dessicate and die. Therefore the animals are usually found in moist situations, for example, in or under fallen logs, under stones, in the bases of tree-ferns and in the leaf-litter on forest floors.

Most Onychophorans are nocturnal, emerging from their resting places at night to search for food. They are very mobile, walking by means of short, clawed legs. The legs, which are extensions of the body wall, are not jointed but are nonetheless flexible and move in a synchronous rhythm similar to that of a centipede.

Although they will eat dead animal material, Peripatids more often hunt small invertebrates such as termites, spring tails and amphipods. The method of food capture is unique in the animal world. On either side of the mouth is a large papilla, and situated at the tip of each of these is an opening of the greatly enlarged slime glands. When confronted by a possible meal, Peripatus raises the anterior portion of the body from the ground and, by muscular contractions of the body wall, directs two streams of slime over the prey. On contact with air, the slime hardens to form a tough, viscous net which holds the food firmly and enables Peripatus to eat a leisurely meal. Slime ejection is also an effective deterrent to Predators.

In Australia, Peripatids have been recorded from Cape York to Tasmania in the east and from south-west Western Australia. There are two genera and seven described species, but in the light of recent work this species list could be extended by

as many as ten or fifteen new members. The two existing Australian genera are:

- (1) PERIPATOIDES, which includes live bearing (ovoviviparous) forms with 14, 15 or 16 pairs of legs.
- (2) OOPERIPATUS, which included egg laying (oviparous) forms with 14 or 15 pairs of legs. The female bears a fleshy ovipositor between the last pair of legs.

Much work still remains to be carried out on this unusual group, particularly in Australia. However, as a consequence of the cryptic habit and environmental requirements of Peripatids, specimens are not readily available and are often difficult to maintain for long periods under laboratory conditions. Despite these obstacles, Peripatus will retain the interest of biologists for some time to come simply because there is so much more to learn regarding its habits and structure.

Robert Hardie, Zoology Department, University of New England.

(A large pregnant female Peripatus sent to the author by our Club produced sixty-four live young. After this magnificent effort, she quite understandably passed away. Ed.)

#### HONOUR TO CLUB MEMBER.

Congratulations to Dr. John H. Barnes on being awarded the M. B. E. in the recent Queen's Birthday Honours for his research into marine stingers.

## IS THERE A QUEENSLAND MARSUPIAL TIGER?

Ellis Troughton, former Curator of Mammals at the Australian Museum, is a foremost authority on Australian marsupials. In his book "Furred Animals of Australia", published in 1946, he discussed reported sightings of the "Striped Marsupial Cat of North Queensland". However in the 1967 edition of his book he states: "The discovery of skeletal remains (of the Thylacine or Tasmanian wolf) in the Territory of New Guinea ... evidently supports my suggestion (P.49) that early accounts of a large striped marsupial cat inhabiting the dense rain forests of North Queensland may have indicated the presence of a few Thylacine survivors."

No specimen of a Queensland Marsupial Tiger has yet been examined and taxonomically described by a biologist nor has one yet been kept in captivity. Yet reports of sightings have been accumulating for over 100 years. In recent months, more evidence of the Queensland tiger has been assembled than ever before, and much of this information is not consistent with sightings of either Thylacine or feral (bush) cat.

In the proceedings of the Zoological Society of London in 1871 and 1872, six accounts of sightings were recorded. One of these was from a surveying party camped in tropical rainforest on the banks of the Mackay River, and it included a drawing of a spoor left in soft ground after a nocturnal visit by the unseen animal. This creature emitted "a loud roar" and was heard on several nights. The foot structure, as seen from the imprint, was markedly different from felines, and was different from all other described marsupials (although bearing a resemblance to the Tasmanian wolf).

Dr. Maurice Burton, writing about the Queensland Tiger in "Oryx," journal of the Fauna Preservation Society, in 1952, argues that there is a definite niche in the Australian ecosystem for a tiger-like carnivore to complement the other known native animals.

Similarly in 1959 Dr. Bernhard Heuvelmans in his book "On the Track of Unknown Animals", drew attention to the Thylacosmilus, the extinct "sabre toothed tiger", a marsupial of South America. There are parallels in the ancient marsupial fauna of that continent and the past and present native fauna of Australia. From similar stock, therefore, it may be supposed that Australia would produce such an animal also. Thylacoleo, a sub-fossil from the Darling Downs, may be that animal and, as Heuvelmans says, "It would be quite natural to find a smaller species of the same group on the same continent."

The fossil skull of Thylacoleo, found on the Darling Downs many years ago, is believed by mammal experts to be the remains of a large lion-like marsupial. The skull is 7" to 3" across, and the highly specialised teeth structure suggests a diet both carnivorous and herbivorous (the experts are still arguing this point). Unless it was a monstrous creature (and the Australian Museum believes it was the size of a leopard only), its head must have been disproportionately large for its frame.

Following are exerpts from some of the recently collated reports from farmers, bushmen and others, many of them people who have spent a lifetime in remote areas and who have placed no more importance on their sighting than they would upon the sighting of a platypus or a dingo.

- "Most of the tiger cats which I have killed were about four feet long and of fawn colour, with black stripes running across the body, which was fairly long, unlike an ordinary cat."

  Kuranda, 1910.
- "I can remember shooting one about the year 1915. They would be slightly taller and he avier built than a domestic cat, with large head and strong shoulders. Also striped rings around the body. This specimen had a young one on each teat, approximately ten in all."

  Tiaro, 1915.
- "... an animal about as large as a medium-sized dog rushed out and climbed a nearly tree. The animal was very savage. Its coat was beautiful and striped like a tiger."

  Bellenden Range, 1925.
- "It was as big as a fairly large dog, striped, and appeared to have a large head." Sarina, 1950.
- "The head was a good deal larger than an old tomcat, with teeth a lot like the extinct sabre toothed tiger (not size but shape)." Mt. Molloy, 1953.
- "... head appeared round and broad, its nose shorter and broader than a dog's. Some of its teeth appeared to protrude out and upward like tusks."

  Mt. Bartle Frere, 1968.
- "The creature defying him had a round face and four exposed "tiger Leeth".

  ... the other salient point in my opinion was the fact that big savage pig dogs were terrified of it."

  Kuranda, 1945.

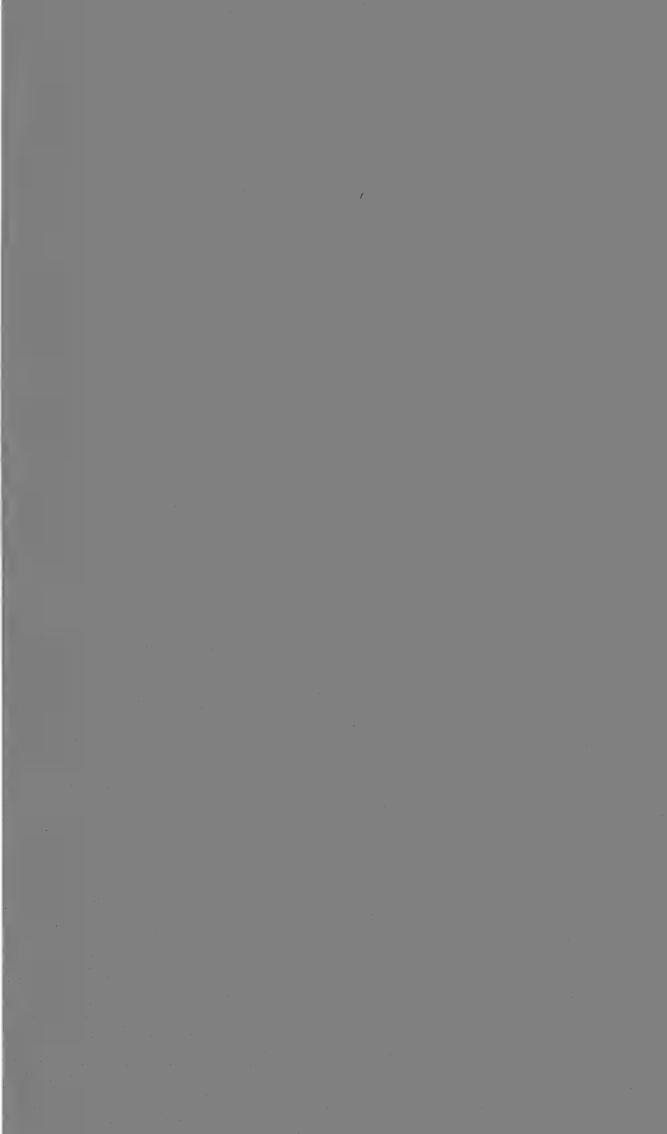
(Prepared from article by Peter Makeig on the work of naturalist researcher, Janeice Plunkett. Miss Plunkett will welcome any help in finding and positively identifying this animal.)



Comparison of spoors: A, the Mackay River "tiger"; B, a labrador kelpie dog standing 21" at the shoulder; C, a large domestic cat standing 12" at the shoulder.

574 H 81





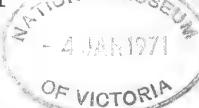
#### THE

## NORTH QUEENSLAND

**NATURALIST** 

CAIRNS

Journal of



#### NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p.m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 38.

November 1970

No. 153.

#### CONTENTS

| Book Review. K. J. M                    | <br> | 2 |
|---|------|---|
| Pot Pourri                              |      |   |
| Flying Foxes. Stanley H. Boyd           | <br> | 2 |
| Bird Notes. Marion Cassels              | <br> | 2 |
| The Australian Hercules Moth. R. Parrot | <br> | 3 |
| ValeAlf Read                            | <br> | 6 |
| An American Rememberance                | <br> | 7 |
| Queensland Pigmy Possums. N. C. Coleman | <br> | 7 |

"Each Author is responsible for the opinions and facts expressed in his or her article."

Club Officers -- September 30, 1969 to September 30, 1970.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. Huddy.

Editor: Miss J. MORRIS.

PATRON - We are pleased to announce that Mr. S. E. (Ernie) Stephens has accepted the position of patron of our Club.

#### **BOOK REVIEW**

"COMMON AUSTRALIAN BIRDS OF TOWNS AND GARDENS" by Graeme Chapman, published by Lansdowne Press Pty. Ltd., price \$2.95.

As stated on the dust jacket, "Thisbook will enable the reader to identify many of the common birds seen around the towns, cities and gardens of Australia. It also provides the amateur bird-watcher and student with an excellent introductory guide to the study of Australian birds and their habits." Included is a section on the structure of birds, and advice on how to attract birds to the suburban gardens. The author is a trained ornithologist and photographer, and the book is amply illustrated with diagrams and many black and white photographs supplementing the sixty-four colour plates. A distribution table shows the capital cities in which the birds described may be seen. Also a list is given of societies and organisations for the bird-lover, including the N. Q. N. C.

K. J. M.

#### POT POURRI

FLYING FOXES. I once watched for an hour as hundreds of flying foxes came to drink at a tank on a Peninsula cattle station. Flying foxes always drink on the wing; they dart down and skim along the surfact of the water, just causing a small ripple. Never once was there a collision as all the foxes flew in from the same direction and none turned back, but they were so thick that by the time they had finished the air was "stinking" with their strong smell.

Stanley H. Boyd.

#### BIRD NOTES.

Recently whilst watching birds on the foreshores my husband and I were surprised and pleased to see five cattle egrets in breeding plumage standing in their characteristic hunched up position in the mud. Cattle egrets in breeding plumage have also been reported up at Daintree this month (November).

Marion Cassels.

#### THE AUSTRALIAN HERCULES MOTH

Coscinocera hercules (Family Saturnidae)

The Australian Hercules Moth, found in North Queensland and in New Guinea, is one of the world's most spectacular moths. The male has a wingspan of approximately eight inches and long slender tails, as shown in photograph. The female is much larger with a wingspan of ten to eleven inches and with short tails broader than the male. Both are brown in colour with clear prominent triangular-shaped eyespots on all four wings.

The young larva is white and spiney, and after fourth instar becomes greenish with yellow spines. The caterpillars feed on several rainforest trees, including Polyscias (Panax) elegans or Celery Wood: Homalanthus, known as Bleeding Heart; Glochidion; Timonius rumphii; and Dysoxylum.

The cocoon is spun with a tough silken thread with leaves drawn together and when hanging in a tree looks like dried leaves. In photograph, the moth is hanging on the cocoon.

\*\*\*\*\*\*\*\*\*

The following is an account of my experience in raising the Coscinocera hercules moth from egg to adult insect in a flat in Cairns.

After coming to Cairns especially to obtain this well known moth, I heard that difficulties had been experienced in raising it, and was curious to find out the reason why!

On August 24, 1969, I finally obtained a female, with the help of a young member of the North Queensland Naturalists' Club. My friend-climbed a very slender tree about 25 feet up where a pair was mating. As he tried to break the branch off the tree, the male let go and glided down and away into the valley where we lost sight of him; but my friend grabbed the female and stunned her, so as to drop her down to me. I quickly picked her up and held on to her to prevent her damaging herself as she was a beautiful specimen. I held on to her for four hours and on the way home she laid one egg.

During that evening the moth rested in a box with netting over it. At 11 p. m. she started to quiver her wings, so I held her while another friend held strips of cardboard under her abdomen on which to lay her eggs. She laid 26 eggs that night. I left the lights on all night and keep waking up to check that she was resting well in her box. Early morning she laid 19 eggs and rested all day till late evening and then laid 48 more. Another night with lights on and in early morning she laid 52 more, making a total of 145 eggs. Then I decided to put her to sleep as she had done her task well.

Within the next ten days I had planted the eggs out in different areas on Polyscias, Homalanthus, and Glochidion in lowland rain forests. I kept four and cut one open and found a small larva in it. So they were fertile!

On September 5th, I discovered the first egg had hatched. What excitement! I placed fresh Glochidion leaves in a bottle of water and moistened the leaves. The tiny white spiney caterpillar crawled onto the new leaves and wandered around till it found some moisture. It drank the moisture three times, then chewed a piece of leaf and wandered again. I covered the whole branch in a big plastic bag with lots of moisture for the night. Next day two more eggs hatched. These two caterpillars were just resting and drinking

moisture off and one, while the first one was eating more now but still drinking also. Next day fresh leaves and moisture were put in the bag.

I brought back four caterpillars that were on Glochidion and noted they were not eating, so gave them moisture and they drank some.

On September 8th, I brought five more caterpillars back and found two others had been eaten by green ants and two had dried up through lack of water. Immediately these five were given moisture and fresh leaves, and they drank first and one could actually see them expanding. Next day I collected some more and found a number of others dried up. So now I had 15 little white spiney caterpillars.

Next day, at another area, I found two caterpillars eating on Polyscias and two eating on Homalanthus, some not eating as they had not enough moisture, also some dried up. I brought them all back, gave them fresh leaves and dampened down for the night. I now had 32 caterpillars altogether.

On September 11th, one had already shed its skin(instar) and the rest were coming along well. The next few days they were given fresh leaves and plenty of moisture, and seven were lost. On September 15th, the 25 were doing well and another one was losing its skin.

On September 17th, the caterpillars were put on small trees. Some were lost in the instar stage and I found a wasp larva on another. What a job!

On September 19th, five more were lost as they seemed to be very sensitive. The first caterpillar had now done two instars. Next day, only ten were left, and were given fresh leaves and moisture. On September 21st, five remained and seemed to be doing well, and were given fresh leaves.

On September 23rd, the one on Polyscias had another instar. I now had three caterpillars, and gave them fresh leaves with moisture. On September 25th, another caterpillar was found, so I now had two on Glochidion and two on Polyscias and in another instar. I noted they were turning a greenish colour in the fourth state.

Every day they were checked and every other day given fresh leaves, and all dampened well each day with a plastic bag over them.

On October 6th, one died on the Glochidion but the rest seemed fine.

On October 8th, another instar.

On October 12th, the other one on Glochidion died, so only two caterpillars on Polyscias were left, but both were huge and doing well. Each day they were checked and given moisture and new leaves every other day.

On October 24th, one went into instar.

On October 27th, the other one went into instar also. They were now over three inches in length and both eating voraciously. Fresh leaves were then given every five days and well moistened.

On November 12th, one was spinning a cocoon.

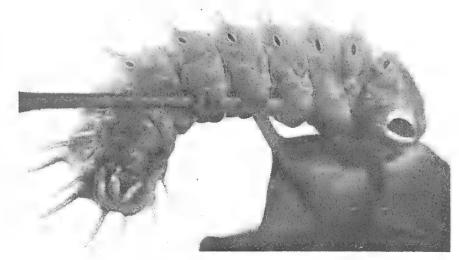
On November 16th, the other one was spinning also, but was having trouble and it died later in the evening. So I was left with one cocoon!

On February 21st, 1970, at 7 a.m. there emerged a beautiful male specimen with an eight inch wingspan, successfully raised in a flat.

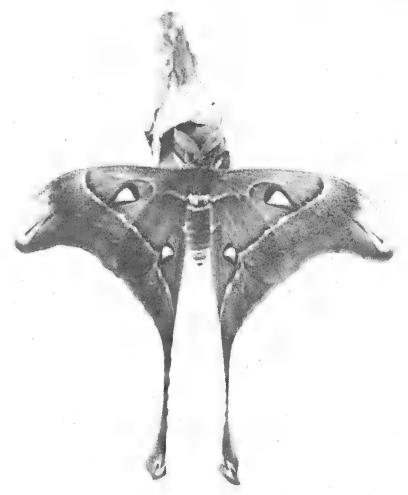
(I gratfully acknowledge the help given by the following members of the North Queensland Naturalists' Club:

 Peter Cassels - help in capturing the female moth.
 Dr. Leonard J. Brass, Botanist - identification of food plants and transportation.)

R. Parrott.



Larva of Hercules Moth.



Male Hercules Moth, Coscinocera hercules (Family Saturnidae).

#### VALE---ALF READ

With the passing of Alfred Arthur Read on June 30 last, not only the Naturalists Club, but the whole of North Queensland, lost an indefatigable worker for Northern interests.

Born in Bendigo, Victoria, in 1894, "Alf" had a lifelong interest in natural history, and once told the writer that this dated from the time when, neatly attired in the fashion of the nimeties - wide-brimmed sailor hat with flowing ribbons and thigh-length black stockings - he fell overboard from the family flattie whilst attempting to add to his already profuse collection of yabbies.

He added: "That was when I learned (after a hefty dose of parental discipline) the cardinal rule of Nature study: 'Patience in all things' when studying wildlife, whether it be furred, feathered, or finned".

A childhood begun in Victoria and continued in Western Australia was followed by a journey through all the mainland States. When he settled in Cairns in the early thirties, he brought to the North a wide knowledge of Natural History accumulated by practical observation during his travels.

Specialising in conchology and having a good general knowledge of marine biology, he became associated with the "Nats" shortly after its foundation, and worked in close co-operation with its founder, Dr. Hugo Flecker, in building the Club to the status which it enjoys today. He followed Dr. Flecker as President, and held this office for a record term of fourteen years.

During the war he served with the C. M. F. on full timeduty, and on his discharge was engaged by the C. R. E. B. as a draughtsman, a position he held until his retirement in 1959.

With his wife, Alison (herself a competent malachologist and a recognised expert on the shells of North Queensland), he founded the original "House of Ten Thousand Shells" - the fruits of his wide collecting on the Barrier Reef and when this was on display at his home in Grove Street, "Coraline" became a meeting-place for conchologists from all over the world.

Alf was one of the pioneers of "stinger research" in Cairns, and in 1958 made "Operation Chironex" the Club's project of the year. At this time very little was known regarding the "stinger", and although the investigation has been brought to a successful conclusion by others, it must never be forgotten that it was Alf - and the club members inspired by him - who initiated the investigation. Whilst advancing this project, he was instrumental in providing the first direct short-wave radio communication between Ellis Beach and the Q. A. T. B. centre in Cairns.

Although giving unsparingly of his time to the Club, Alf also had other interests. He was an executive committee member of the Cairns Show Association for many years and was awarded a Life Membership of the Association shortly before his death.

Amongst the many other honours which came his way during his long lifetime, (he was an Honorary Magistrate and held high office in several Fraternal orders), the one he valued most was his Life Membership of the "Nats". Even in retirement and with failing health, he could not abandon his interest in marine life, and acquired a collection of crustaceans which has already attracted the attention of the Australian Museum.

#### AN AMERICAN REMEMBERANCE

Dr. Sheldon Miller, M.D., of Merrick in New York State, never met our late Past President, but they had corresponded over a period of many years.

On receiving the sad news of Mr. Read's passing he decided to commemorate his friend in a practical way. As a result, the Merrick High School is to receive a microscope inscribed "In memory of Alfred A. Read of Cairns, Australia. Naturalist". This will be the personal gift of Dr. Miller.

In addition the family - Dr. Miller's wife and three teen-age children - have set aside a sum of money to be divided equally between the American Heart Foundation and the Blue Nursing Service, Cairns.

-Again "In Memory of Alfred Read - Naturalist".

A fine gesture, and an indication of the esteem in which our late Past President was held overseas.

#### QUEENSLAND PIGMY POSSUMS

While on nature study outings on the Atherton Tableland, I have several times disturbed specimens of a very small possum-like animal from their retreats. On three of these encounters, the light and distance allowed observance of colour and detail sufficient to convince me that, in these instances, a species of pigmy possum had been seen, and in one case examined in hand.

The first clearly seen animal was disturbed by my brushing past a clump of ferns on one end of a large rotten log. What seemed at first sight to be a rat ran from the ferns to the other end of the log, about 14 feet away, and sat up facing me. By carefully moving away from the log but closer to the animal, I managed to get some details of its form and colour.

Description: Body length about 4 inches, with tail of about equal length. Snout grey or light brown, very sharp. Ears large and round. Eyes seemed black and bright and were surrounded by a patch of black fur. Top and sides of head, back and sides of body, deep brown; underparts from lower lip to lower abdomen, white. The tail, held at a slight curve behind the body, seemed fuzzy as though covered with fine hair. Feet could not be seen, but the hands, which were held close to the chest, were yellowish and seemed disproportionately large.

After a short time the animal ran back along the log to the fern clump, and I was able to see that part of the tail under the tip seemed bare.

I tried to approach the fern clump for a closer view of this little creature, but it ran out of the ferns, sprang to the trunk of a small tree near the log and quickly vanished in the foliage. On investigation, the fern clump was found to contain a large ball of dead leaves and fern fronds, about 7 inches by 6 in ches, with a 2 inch hole at one end. This was opened slightly but was unoccupied.

This specimen was in heavy rainforest on volcanic soil at an elevation of about 2500 feet.

The second specimen was found in a tall rotten stump. When a large piece of the dead wood was broken away, a ball of dead and partly green leaves rolled out and a small rat-like animal jumped from this and tried to hide under the debris at the side of the stump. I quickly had this specimen in a large jar and during the next hour a few fellow naturalists and I examined it closely. Due to its persisting in rolling itself into a ball with the head pressed close to the abdomen, it had to be taken in the hand for better inspection. It made no attempt to bite but gave out a sound like a low, hissing purr.

It was a female marsupial with a very small pouch opening, and by the feel of the pouch, was carrying young.

Description: Body length about 4 inches, with the tail about  $\frac{1}{2}$  an inch longer. Tip of snout pale red, snout very slender with short greyish-brown bristles pointing back at an acute angle. Upper surfact of snout to mid-face, grey; face, head, back and sides, dark brown blending to white on lower sides and abdomen; underparts from lower lip to base of tail, white. Eyes bright, black, in black fur patch. Ears large and almost round, grey, blending to brown on head. Hands large, for so small an animal; claws sharp. Feet large, big toe without claw, toes 2 and 3 joined closely together to top joint with the two claws very close, almost touching each other. Hands and feel yellowish. Tail slender and tapering, with fine fur throughout length on top and sides, bare underneath for about 1 inch of tip and relatively bare underneath for most of its length. Top and sides of tail with very fine bristles giving a slight brushy appearance. Tail very prehensile, proved by trying with finger. The animal supported its weight by the tail with only a part turn of the tail around a finger.

About  $1\frac{1}{2}$  hours after capture the animal was released in a tree near its nest site. This specimen was found in an area less than half a mile from where the first specimen was seen, in heavy rainforest on volcanic soil.

The third specimen was disturbed in an area of open casuarina and eucalypt forest near moderately dense rainforest. Some flitches and bark had been thrown into a rough heap during sleeper cutting, and when this was turned over in search of beetles, a small animal ran out from the pile to a nearby tree up which it climbed with speed to the first fork, about 17 to 18 feet-high. It remained in the fork long enough for me to examine it with binoculars. As the day was fine and sunny, the details of this little animal showed out clearly. A dark patch on the lower abdomen indicated a pouch. Other details of colour and form showed a close resemblance to the first two descriptions.

The animal later climbed much higher in the tree among the fine foliage.

Short notes taken on these three occasions were compared with Ellis Troughton's book, "Furred Animals of Australia", and I believe the animals were all one species, Eudromicia macrura.

N. C. Coleman.

#### THE

## NORTH QUEENSLAND

Journal of



#### NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

> ADDRESS - Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS - Second Tuesday of each month at Oddfellows Hall, Lake St., 8p.m. FIELD DAYS - Sunday before meeting. Notice of place and time given in "Cairns Post,"

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 38

April, 1971.

No. 154.

#### CONTENTS

| Obituary. J. O   |      | Page 2 |
|--|------|--------|
| Pot Pourri - Strange Diets                             |      |        |
| From Under a Pile of Iron - Marion Cassels             |      | Page 3 |
| Bird Notes. Marion.Cassels                             |      | Page 3 |
| Range Extension of the Long Tailed Pigmy Possum on the |      |        |
| Cape York Peninsula, Queensland. Hobart M. Van De      | usen | Page 4 |
| Whale Grass (Reef Spawn), A Red Tide Phenomenon in     |      | •      |
| Local Water. Margaret Flavell, M. Sc                   |      | Page 5 |
| Book Review. K. J. M                                   |      | Page 7 |
| Juvenile Mortality in Danaus Plexippus. John Orrell    |      | Page 7 |

"Each Author III responsible for the opinions and facts expressed in his her article."

Club Officers -- September 30, 1970 to September 30, 1971.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. HUDDY.

Editor: Miss J. MORRIS.

Patron: Mr. S. E. STEPHENS.

The Editor urgently requires more material for the journal from Club Members or guest writers.

#### **OBITUARY**

The sudden passing of Stanley H. Boyd at Cooktown, early in December, saddened not only Club members, but naturalists throughout the North. Born in Cooktown on January 2nd 1888, Stan was a "natural naturalist". His keen powers of observations, coupled by a willingness to share his vast knowledge with all and sundry, made him a well-known personality, not only in North Queensland, but overseas as well.

He was the instigator of the original Cooktown Museum and for many years acted as its curator in an unpaid capacity, thereby nourishing an acorn which flourished into the oak that is now the James Cook Museum.

His crisp reminiscences on natural history appeared in many publications throughout the world, from the prestigous "Animals" of Gerald Durell to the privately-printed "Folklore Magazine".

His last published par (on Flying Foxes) appeared in the November

"Naturalist".

Cooktown - and indeed North Queensland - won't be quite the same without him . . . . .

#### POT POURRI

STRANGE DIETS.

In our bird books we are usually told the food that various birds eat, but I have found over the years that most birds have a pretty varied diet. The Spangled Drongo is usually thought of as a meat eater, but I have seen him assiduously going over the Grevillea and Callistemon trees taking the nectar like any honey-eater or Lorikeet.

In our garden we have a bird bath which is very well used. There was some green algae in long strings growing in the water and one day I saw a female Magpie Lark pull out a long string and swallow it. She did this three times

and later on my husband saw her do it again.

The Grevillea pteridifolia flowered very well this year and set a lot of seed. I noticed that the female fig bird was using some of the twigs for her nesting but then I also noticed that she was eating some of the seed straight from the tree. Lately a number of fig birds were milling around on the ground under a poinciana tree and I saw some of them with seeds in their beaks. I did not actually see them swallow the seeds.

#### FROM UNDER A PILE OF IRON

I always thought a frog was just a frog until recently when I found that there were many different kinds, shapes and sizes of order "Anura" - which means "double life" referring to the fact that frogs and toads live in water and on land. Nor did I realise how many different kinds of lizards and snakes there were ( of the order Squamata) but when a member of the Club from New Guinea, Mr. Fred Parker, visited us in Cairns a few weeks ago we learnt a great deal about these two orders.

One of our trips was to a property at Holloways Beach near Cairns to see just what lived in that area. We went to a cleared piece of land adjoining eucalypt woodland where there were some piles of old iron. These are ideal for a lizard or snake hunt. Carefully moving the iron piece by piece we stood by ready to run or catch what ever came out. I will leave Fred Parker to describe the frogs of Cairns area in an article he has promised this journal but the following is a list of the lizards and snakes seen during a couple of hours searching.

CARLIA BICARINATA - a small brown grass skink very common in grass.

C. NOVAE GUINAE - only one of these very small secretive skinks was found.

C. FUSCA. - this is a large Carlia nearly 6" in total length. It is grey with white lips and a red throat.

CTENOTUS SPALDINGI - a swift moving ground skink, striped brown and black.

C. VAERIOLATUS - is a smaller species differing in having striped flanks, not blotched as in spaldingi.

DIPORIPHORA BILINEATA - this long name just means one of our familiar little Tommy Roundheads, a large headed dragon. This was a small grey fellow.

GEHYRA AUSTRALIS - is a very common grey tree gecko.

SPHENOMORPHUS PARDALIS - a brown smooth scaled burrowing skink which took some catching as it tried to burrow back into the soft ground.

DEMANSIA PSAMMOPHIS - more commonly known at the Yellow faced whip smake. It was a pale green with rust red on the anterior body and a yellow ring round the eye. A fairly common snake around Cairns.

MORELIA SPILOTES VARIEGATA - a carpet python. This fellow was really annoyed at being disturbed and as he was being held up for inspection turned and bit Fred's ankle, drawing blood. Not that that worried Fred who just shook him off and carried on with what he was doing.

I am sure that had we had more time at our disposal we would have found many more interesting creatures at Holloways Beach.

Marion Cassels, Cairns.

#### BIRD NOTES

Recently whilst watching birds on the foreshores my husband and I were surprised and pleased to see five cattle egrets in breeding plumage standing in their characteristic hunched up position in the mud. Cattle egrets in breeding plumage have also been reported up at Daintree this month (November).

# RANGE EXTENSION OF THE LONG TAILED PIGMY POSSUM ON THE CAPE YORK PENINSULA, QUEENSLAND

The interesting observations by N. C. Coleman on the long-tailed pigmy possum of north eastern Queensland in The North Queensland Naturalist (vol. 38, no. 153, November 1970) are admirable in their detail, and point up the fact that valuable information on our local mammals can be obtained by observant naturalists. Members of museum expeditions are always pressed for time, and rarely have the opportunity to make such detailed observations. However, mammalogists with study collections at hand are in position to map out the geographical distribution of genera and species, and to evaluate the distinctness of populations.

In 1916 the Swedish naturalist, Mjoberg, based a new genus and species of pigmy possum, Eudromicia macrura, on a series of four specimens which he collected in 1913 at Cedar Creek. Wakefield (1963) in his review of the Australian and New Guinea pigmy possums classified all of these tiny possums (except Acrobates, Burramys, and Distoechurus) in the genus Cercartetus. He also concluded that Eudromicia caudata of New Guinea was conspecific with Eudromicia macrura of Cape York. Therefore, the possums discussed by

Coleman now bear the name Cercartetus caudatus macrurus.

Tate (1952), leaning heavily upon the botanical knowledge of Dr. L. J. Brass, discussed the distribution of rain forest in Queensland. The Cooktown-Cairns-Townsville stretch of rain forest is the only area in which Cercartetus c. macrurus has been found. In fact, as Wakefield (1963) pointed out, there were only eight museum specimens of the long-tailed pigmy possum available for his study "all from within 50 miles of Cairns". One of these important specimens (AMNH 155090) was donated to Tate and Van Deusen, members of the 1948 Archbold Cape York Expedition, by the North Queensland Naturalists Club; this spirit specimen bore the number 404 and became number 11590 in the Archbold field catalogue. The exact provenance of this male and the date of collection were not known. However, it could have been collected on the Atherton Tableland, a favorite area for outings by the members of the Naturalists Club. Tate (1952) gave the following data for this individual, "west of Cairns (presented by Mr. George Brooks)"; in the field catalogue, however, this information applies to a small free-tailed bat (Tadarida) entered on the line above, under catalogue number 11589.

Jack Roberts of Shipton's Flat, our host at that locality, during the 1948 Expedition, has sent a second male specimen (AMNH 196633) to the Archbold Collection. This individual was caught by a cat and brought to the Roberts' house sometime during 1966 or 1967. This record extends the known range of Cercartetus caudatus macrurus northwards to about 30 miles south of Cooktown. This small arboreal marsupial was not obtained by Tate and Van Deusen in 1948 during their two weeks of collecting in the vicinity of Shipton's Flat. Brass (1953) gave an excellent description of this locality. Tate (1952) observed that "these tiny 'dormouse phalangers' may be fairly common in the rain scrubs (forests) of the Cairns region, and I suspect that they will eventually be demonstrated in the Iron Range and McIlwraith

Range rain forests. "

The domestic cat is a well-known collector of small mammals. In fact, the other long-tailed pigmy possum from Mt. Carbine (Queensland Museum, J. 7011) was also brought in by a cat. Some of our most interesting and important mammal records are obtained in this fashion. I urge all cat owners to examine small mammals so captured, and to preserve such specimens in alcohol together with a note on the date and locality. Dr. L. J. Brass is resident in Cairns, and will gladly make arrangements to forward such specimens to the Queensland Museum or to the Archbold Collection.

Brass, L. J. 1953. Results of the Archbold Expeditions. No. 68. Summary of the 1948 Cape York (Australia) Expedition. Bull. Amer. Mus. Nat. Hist., vol. 102, pp. 135-206, fig. 1, pls. 41-47.

'Mjoberg, E.

1916. Handl. Kungl. Svenska Vetensk. Akad., vol. 52, no. 2, pp. 13-20.

Tate, G. H. H.

1952. Results of the Archbold Expeditions. No. 66. Mammals of the Cape York Peninsula, with notes on the occurrence of rain forest in Queensland. Bull. Amer. Mus. Nat. Hist., vol. 98, pp. 563-616, figs. 2, tabs. 6.

Wakefield, N. A.

The Australian Pigmy-Possums. Victorian Naturalist, vol. 80 1963. pp. 99-116, figs. 4, table. 2, maps 2.

> Hobart M. Van Deusen Archbold Collections The American Museum of Natural History New York City.

15 March 1971.

Mr. Van Deusen advises that he will be glad to send to anyone interested copy of his paper, American Museum "Novitates", on the hoary wattled bat of Queensland, which will be published in April or May, 1971. (See N. Q. Nat., vol 36, no. 148.) The distribution of Chalinolobus picatus and C. nigrogriseus is mapped. Some members may be interested in the issue, on March 31, 1971, of

five mammal stamps from the Territory of Papua and New Guinea. A brochure prepared by Mr. Van Deusen, describing these mammals, is to be distributed with the stamp issue. Available from:
Philatelic Bureau, G. P. O., Port Moresby, T. P. N. G.

#### WHALE GRASS (REEF SPAWN), A RED TIDE PHENOMENON IN LOCAL WATERS

North Queensland fishermen report, during the summer months and particularly after north-easterly winds, that large areas of the sea are covered with red-brown slime. Aircraft have reported the same phenomenon as oil slicks off the coast, a conclusion drawn from its calming effect on the water's surface and its dark appearance from the air. What is this phenomenon?

Biologists know it as a Red Tide. It is caused by a microscopic planktonic plant, multiplying rapidly and its cells aggregating together.

Is it ■ recent Phenomenon?

It is not the result of man's pollution of his waterways, for records of red tides can be traced way back in time. One of the earliest reports is found in the Bible (Exodus 7, 20-22), another in the Iliad, and our own local one in Captain Cook's Log. Records show it can occur in freshwater. or seawater.

What causes a red tide to appear?

Red tides are only observed during some months of the year, locally from October to March, and it is thought that the amount and availability of nutrients in the sea is perhaps the greatest factor influencing the great

increase of this microscopic plant. Red tides appear particularly in oceanic areas where there is upwelling of waters. Large scale water movements and local disturbances in the chemical and physical conditions of the sea seem to have an effect.

What effect does a red tide have on other life?

The main effect is that the mass of plant material causes suffocation to animals coming into its vicinity. Many dead fish have been seen floating amongst the "weed" and it will also kill barnacles, oysters, shrimps, etc. The Japanese pearling industry has several times been almost wiped out by red tides.

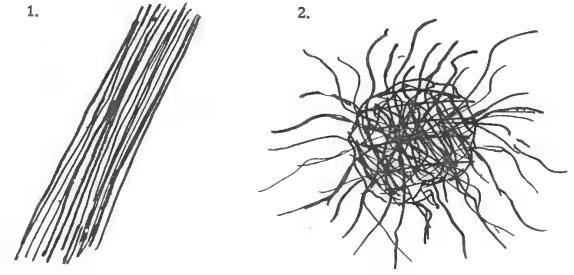
A secondary effect is the obnoxious smell the material has as it dies, exposed in full sunlight on the surface of the sea. Tourists in Townsville flee when the red tide is washed ashore!

How often do local North Queensland outbreaks occur?

Data suggests it is an annual occurence, but researchers have found that the microscopic plant is present in small numbers even when it is not apparent. It does not in fact totally disappear from local waters at all. What is the specific plant causing the North Queensland red tide?

It is a blue-green alga called for many years Trichodesmium, but recently referred to as an Oscillatoria. It has box-like cells which stick together one on top of the other to form a filament. The filaments themselves then stick together side on and form a bundle or sheath, which is just visible to the naked eye.

There appear to be two types in local waters, one forming bundles of regularly stacked filaments and the other forming a ragged ball of filaments



Both are usually present but numbers of each fluctuate. Fishermen call it whale grass or reef spawn.

Does the North Queensland plant form red tides anywhere else?

Trichodesmium has been recorded in Gulf waters and an odd record from as far west as Perth is known. It is also in reef waters off India.

Are there other plants which form red tides? Around the world there are different planktonic plants giving the same

effect. Two of the best known are Gymnodinium and Gonyaulax, for these genera (unlike ours) accumulate toxin in their cells. If they or any animal which has been feeding on them is eaten, paralysis and death can occur. Florida records deaths from Gymnodinium and Britain puts out warnings every year about Mussel poisoning, the mussels having fed on the glut of Gonyaulax.

Why is it called a red tide?

Most of these "tide" - formers are green plants and the surface waters can be discoloured green, yellow, orange, brown, red and other shades by them. The local red water is due to a red pigment being released into the water as the filaments of Trichodesmium are dying. The filaments themselves go from a blue-green to a grey-green colour.

Can the red tide be controlled?

Authorities in America have built dams across major rivers in an effort to regulate the release of freshwater from the rains. They believe the rainy season adds a large amount of nutrients to the sea and stirs up the waters, providing optimum conditions for Gymnodinium to multiply. This of course is a tremendously costly project.

Other efforts at control involve the use of chemicals. However, a lasting chemical of selective toxicity has not yet been found, so chemical

control is only possible on a small scale.

But the question one should really ask is, whether it is wise to control this natural phenomenon? Could not the balance of life in the sea be upset if there were no red tide?

There are certainly advantageous effects of a red tide, patticularly our local one. Firstly, it is a food source for many filter-feeding animals. Secondly, on decay it will release a large quantity of valuable nutrients into the impoverished tropical waters. Thirdly, it is now known that Trichodesmium can fix atmospheric nitrogen (one of the few plants that can). This build up of nitrogen in the cells will be released on decay as usable valuable nitrate.

Until there is more scientific fact and research, the red-tide phenomenon should be left to reveal its true nature. There are many roads to follow. One that comes to mind is whether there might be a link between a red-tide organism or another planktonic plant and Ciguatera poisoning. This poisoning, which causes sickness and affects the nerves, occurs after eating certain large Barrier Reef fish.

Could it be that in North Queensland we have a phenomenon like the

killer plant or the British poisoned mussel?

Margaret Flavell, M. Sc.

#### **BOOK REVIEW**

"KOOKABURRAS" by Veronica A. Parry. Published by Lansdowne Press, Pty. Ltd., price, \$4.25.

This book is the result of two and a half years study of the kookaburras in an area of the Dandenong Ranges. Some indication of the knowledge gained from the systematic observation of individual birds and family groups is given by such chapter titles as: The Kookaburra's Social System; The Size and Function of Territory; Vocal Behavious - the Laugh Song, the Calls; etc. Most interesting is the discovery that sexually mature offspring of a mated pair will remain in the parents' territory for up to three years or more, sharing in territory defence and the care of succeeding young. Thus perhaps a third of adult birds in an area may be non-breeding - a form of population control? An enjoyable, informative book, enhanced by colour and black and white photographs.

K. J. M.

"NATIVE MAMMALS OF AUSTRALIA" by Dr. David Rider. Angus and Robertson, \$7.50. A splendid book by one of Australia's finest mammalogists. Hobart M. Van Deusen.

#### JUVENILE MORTALITY IN DANAUS PLEXIPPUS

During investigations into the life-history of the "Wanderer" butterfly, (Danaus plexippus) it became apparent that there was, in the natural state, a 90% to 95% wastage between the egg and the adult. This figure was

arrived at by actual counts of eggs, and pupae harvested from Calotropis procera (the "Crown Plant"), one of the Asclepidiacae and the food-plant of this particular Danaid.

Various raising-techniques were tried under laboratory conditions, and finally a system was developed whereby a 50% to 75% success could be anticipated by hymidity, control

anticipated by humidity-control.

Close and continual observation of both "wild" and "laboratory" larvae

showed that some early mortality was due to:-

i. <u>Egg-cannibalism</u>. On several occasions, when two eggs had been laid on one leaf, the first-hatched/would seek out the other egg and eat its sibling.

ii. Direct cannibalism. This was never observed in the "wild" larvae, but crowding on breeding-trays proved, that, under certain conditions,

the 1st and 2nd instar larvae would attack and eat each other.

iii. Drowning in latex. For the first six or seven days of its life the larva of D. plexippus adopts a singular dietary habit, eating small circle, (about the size of a five-cent piece) out of the leaf, but seldom penetrating through the middle membrane. In young and tender leaves - particularly after rain - the milky latex of the host-plant filled these depressions, and the larvae 'bogged down'.

iv. Drowning by dew. Several larvae were found drowned after a heavy dew, their circular pits having filled with condensate during the night.

Analysis of the preliminary tabulations, (these observations were made over a period of three years, and are still being continued) showed that the forementioned causes accounted for approximately 50% of the known

mortality.

Further observations showed that an egg-loss of 80% could occur between oviposition and hatching on the fourth or fifth day. To determine the cause, twenty-five eggs were placed on a hatching tray in a darkened shed. Light was provided by an amber darkroom lamp with a 10 watt bulb, placed at ten feet from the tray. A careful watch was kept from 7 p.m. onwards, after the experiment had been set up. At 8 p.m. a Huntsman spider (Isopoda sp.) investigated, but ignored the tray. At 9.30 p.m. a cockroach (believed to be, but not positively identified as, Escala circumducta) flew in, alighted on the tray, and proceeded to eat every egg. (These insects are common in most gardens, and up to this time I had always regarded them as pest. It would appear that they can now be classed as 'useful' insects, but I have a private wish that they would develop taste for the eggs of Catopsilia pyranthe crokeri, which regularly denudes poincianas and cassias in Cairns gardens)

Raising-technique was modified to cope with this night-predator, but it was noted that an occasional egg still disappeared, even though the trays

were covered with plate glass.

Whilst making routine 'outside count' on one occasion, small ant was seen to attack an egg, seizing it in its jaws and attempting to remove it from the leaf. Egg and ant became a microscope slide, and the predator was later identified as Pheiodole megacaphala. Considering the size of this aggressor's head, the specific name is fully justified.

Further watch on the Calotropis has shown that when the female D. plexippus is not laying, only an occasional ant - apparently a 'scout' - can be seen on the shrubs. Immediately a female begins to lay, the ant

population increases.

Should a 100% harvest be required, it is necessary to stand by the plants and collect the eggs as soon as they are laid. Many eggs - even if left for a short time - will show, under microscopic examination, the punctures of

an ant's jaws.

When hatched, the caterpillars are pugnacious creatures, not hesitating to 'fight and bite' up to their third instar. After this stage, their bites are not usually fatal, but about 50% of cage-reared specimens reach pupation with definite scar-tissue on their bodies. This scar does not pass on to the pupa.

[Ohn Orrell.]

574





#### THE

## NORTH QUEENSLAND

### **NATURALIST**

CAIRNS

Journal of



Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS – Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 39

August, 1971.

No. 155.

#### CONTENTS

| Protection for Kangaroo                                  | Page 2 |
|--|--------|
| Cook's Kangaroo. Joan A. Bree                            | Page 2 |
| Wau Ecology Institute                                    | Page 3 |
| Panelling in Cairns City Council Chambers. K. Cairncross | Page 3 |
| Some Frogs from Southern Cape York Peninsula.            |        |
| Fred Parker and Charles Tanner                           | Page 4 |

"Each Author in responsible for the opinions and facts expressed in his or her article."

Club Officers - September 30, 1970 to September 30, 1971.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. HUDDY.

Editor: Miss J. MORRIS.

Patron: Mr. S. E. STEPHENS.

#### PROTECTION FOR KANGAROO

On 5th August the "Cairns Post", in a United Press International report from Sacramento, stated that the California Senate has approved legislation to add the kangaroo to the list of endangered species from which no commercial product can be made or sold in California.

Meanwhile, A Sydney man has sent up to Queensland for 2,000 Kangaroo and Wallaby heads to be stuffed for sale to tourists.

000

#### COOK'S KANGAROOS

In Hawkesworth's record of Cook's voyage, the kangaroo illustrated in his first engraving (done from Stubb's painting, Parkinson's sketches and description by Banks) is identified by H.J. Frith and J. H. Calaby ("Kangaroos") and A. Poignant ("The Improbable Kangaroo") as the eastern euro, Macropus robustus.

I suggest that the female antilopine kangaroo, Marcopus antilopinus, be considered as a possibility here.

About ten months ago we acquired a young antilopine kangaroo doe. My observations over these months find amazing likeness in this etching to my young animal.

She fits the picture almost exactly: similar colouring; long, slender smooth tail unlike the shorter, thicker, much hairier euro tail; smooth feet — no long hairy fringe as the euro has; very slender shoulders, unlike the "chunkier" euro; the shape of the muzzle — longer and more pointed than that of the euro; and most strikingly, the attitude. The young antilopine strikes up this remarkable attitude when she is curious but uncertain about a situation.

Distribution of M. antilopinus as indicated by Frith and Calaby includes Cape York Peninsula to south of Cooktown.

Joan A. Bree, Lower Mitcham, S.A.

#### WAU ECOLOGY INSTITUTE

The Bishop Museum New Guinea Field Station is shortly to be superceded and incorporated as a local non-profit corporation under the name of WAU ECOLOGY INSTITUTE. It will be directed by a local board of directors, which initially will include the undersigned, to be advised by a group of scientists to be appointed.

The Institute will take over the functions of Bishop Muesum Field Station and will receive a subsidy plus grant field funds and some research personnel salaries from Bishop Museum (Honolulu).

The Institute will develop a free public zoo and associated gardens and operate some agricultural land and rent houses to visiting scientists for partial basic support, such as salaries of Manager and local staff. It will also invite advanced classes in the Territory and research fellows from elsewhere for courses in ecology and for research. Studies already commenced include Ecology and biogeography of Nothofagus insects; Epizoic symbiosis; Ectoparasite/mosquito/host studies.

Michael Robinson and party have been spending a year here studying behaviour of spiders, stick insects and predatory mammals. Other researchers are planning to study here soon.

At this time, to help found the corporation, start the zoo, and arrange fellowships, we would like to solicit individuals and business or other organisations to become shareholders of WAU ECOLOGY INSTITUTE by contributing sums of A\$1.00 or more. This money will be used primarily for construction of cages for the zoo, expanding the arboretum, and for student and research fellowships.

Mr. Theo Stiller, for the past six years teacher at Banz Lutheran Agricultural School, has been engaged as Manager.

Omas Genora
J. Linsley Gressitt.
A. Lloyd Hurrell.
Michael J. Leahy.
Henry V. Ohlmus.
Kenneth P. Lamb
R.W. Hornibrook.
J.J.H. Szent - Ivany

March 1971.

## PANELLING IN CAIRNS CITY COUNCIL CHAMBERS

Timber panelling in the Cairns City Council Boardroom is Red Cedar, but has been ruined by being stained to appear brown. This timber now carries the botanical name, Toona australis. Formerly it was known as Cedrela toona var. australis.

The counters in the Council Office are constructed of Queensland Maple. Two different timbers are marketed under this name. Flindersia brayleyana and Flindersia pimentelliana, and there is practically no difference in their appearance. Both are subject to considerable variation in grain effect, depending on the angle at which they are sawn from the log. They are also noted for considerable colour variation.

K. Cairncross, Cairns.

## SOME FROGS FROM SOUTHERN CAPE YORK PENINSULA

PART 1. — Bufonidae, Leptodactylidae, Microphlidae and Ranidae.

This article lists species of frogs found by us at a series of localities from Cooktown north and west across the peninsula to Edward River Settlement. Collections were made in the rain forest in the Mt. Hartley — Big Tableland area south of Cooktown and in Eucalypt woodlands and forest in the drier centre and west of the Peninsula. A brief description of each species is supported by a photograph which will aid in identification.

This list may not be exhaustive — other species may yet be found in these areas. Again this list cannot be applied to other areas — for example in the Cairns area many other species are to be found. For definite identification any frogs should be preserved in 4% formalin and sent to a state museum along with data including the date and place of collecting and description of the vegetation in the area.

A further sixteen species of tree frogs were collected, and these will be the subject of a later article.

Family Bufonidae.

#### Bufo marinus (Linnaeus) The Cane Toad.

This ubiquitous introduced animal would be well known to naturalists in North Queensland, and is easily distinguished by its large size, rough skin, mottled belly and enlarged glands behind the head. It is common along the east coast but as yet has not spread far into dense rain forest (except along roads and in clearings) or west of the ranges in drier country.

Family Leptodactylidae

#### Crinia sp.

This small undescribed froglet has a number of colour morphs similar to those of C. signifera Girard but adult males reach only 17 mm. and the call is a single musical chirp. It is found in the drier areas under leaf litter and other cover beside rivers and lagoons. Overall colour is grey to brown and the belly white.

Cyclorana alboguttatus (Gunther)

The Striped Burrowing Frog

A large ground frog found near streams and lagoons west of the ranges. A female from King River measured 80 mm. in body length, males are shorter. It is reported to estivate in burrows during dry periods, and to store water. Usually brown and green above with a pale vertebral stripe.

#### Cyclorana australis (Gray)

This species is closely related to the Water-holding Frog (C. platycephalus) of inland Australia. It is found in sandy areas often well away from water. Yellowish to pale brown above, often with darker mottling. The iris is pale gold above the pupil, brown below, while the belly is white.

#### Cyclorana dahli (Boulenger)

A large water frog not previously recorded from Queensland. It was found along the lower Edward River on the west coast of the Peninsula.

Growing to at least 53 mm. in length, this species is strikingly adapted to life in water, having a small head with pale silvery eyes set towards the dorsal surface, and stout, heavily webbed hind feet. Dorsal surfaces are olive to green with a pale vertebral stripe and scattered green spots. The belly is deep yellow. This frog appears to spend most of its time in water.

#### Limnodynastes convexiusculus (Macleay)

A blotched olive-grey ground frog growing to about 40 mm. and found in all habitats with the exception of rain forest. The belly is white, and iris pale gold.

### Limnodynastes dorsalis (Gray) The Banjo Frog

A dark brown stout frog with short legs and rough dorsum. A large oval gland on the upper surface of the tibia distinguishes the species. The dorsum is black and brown and the flanks brown and yellow while there are red areas in the groin and armpit. The belly is yellow. The iris is pale grey-brown. Adults reach about 80 mm. in length.

### Limnodynastes ornatus (Gray) The Ornate Burrowing Frog

This small, stout burrowing frog is very common in drier country and is usually associated with sand. Some shade of pale brown above - uniform or with pale blotch or pale stripes; the belly is white. The iris is silver-grey, the pupil lozenge shaped. Males reach to 35 mm. females to 40 mm.

#### Mixophyes schevilli (Loveridge)

This very large rain forest frog is usually found near rivers. Reddish to brown above with darker blotches. There is a narrow dark line along the upper face and fine dark bars on the legs. Ventral surfaces are cream. Iris red-bronze. The call is single loud 'Krok'. Males reach 93 mm. females 105 mm.

#### Notaden melanoscaphus (Hosmer)

This species has been found from the ranges west of Cooktown to the west coast of the Peninsula but nowhere else on the Queensland mainland, but Tyler (1967) recorded it from Mornington Is. The large elongated inner metatarsal tubercle is used in digging, this being a burrowing species having a vertical burrow. The dorsal colour is pale grey with a pattern of dark blotches. The iris is silver with black venation. Adults reach about 43 mm.

### Taudactylus acutirostris (Andersson) The Tinker Frog

A rain forest dweller, first described from Malanda. Found under leaf litter and near streams, the call is a high 'tink...tink...' Males grow to 23 mm., females to 30 mm. Pale brown above, the lateral surfaces grey to black. Yellow to white below, sometimes with brown spots. The iris gold above and bronzybelow the horizontal pupil.

#### Uperoleia marmorata (Gray)

A small rugose ground frog characterised by a pair of enlarged parotoid glands behind the head. The call is a loud, ventriloquial 'krrk'. Males reach 23.5 mm. females 26 mm. Greyish brown above often with darker blotches. Deep red areas in groin and on thighs. Iris silvery. Belly white.

#### Family Microhylidae

#### Cophixalus exiguus (Zweifel and Parker)

First described as a result of our 1968 collecting, this small frog has been found only in rain forest about 20 miles south of Cooktown. Two closely related species, neglectus and ornatus are found in the Cairns area. Exiguus grows to a length of only 18 mm. and is found under logs and leaf litter in rain forest. Brown above, sometimes with one or two pale stripes. Iris is silvery to pale yellow, the contracted pupil is horizontal with a dark red blotch at each end.

#### Sphenophryne fryi (Zweifel)

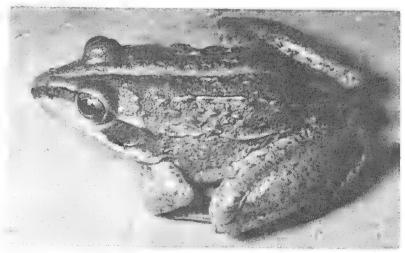
A small species reaching 30 mm. in length, found along with the preceding species only in rain forest. Pale to dark red-brown above with finer dark spots. Often there is a pair of pale dorsolateral stripes. Orange to dull red below. The iris is brown.

#### Family Ranidae

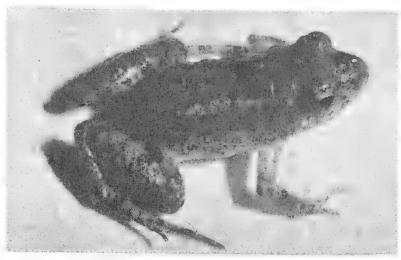
#### Rana daemeli (Steindachner)

A large ground frog usually found in rain forest, but occasionally in gum forest. Found along rivers, the species is partly diurnal. Uniform brown above, grey flanks, white underparts. Iris pale gold above, brown below. Grows to over 70 mm. The call is a low quacking sound.

by Fred Parker and Charles Tanner.



1. CRINIA SP. (17mm.) - Cooktown.



2. CYCLORANA ALBOGUTTATUS: (80 mm.) — Laura.



3. CYCLORANA AUSTRALIS

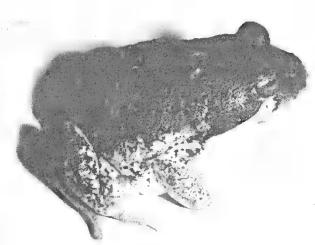
– Edward River.



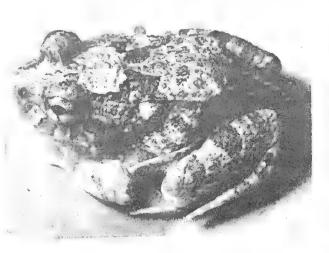
4. CYCLORANA DAHLI (53 mm.) — Edward R.



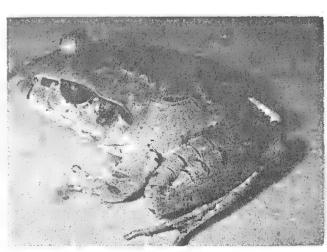
5. LIMNODYNASTES CONVEXIUS— CULUS (40 mm.) — Cooktown. (C. Tanner)



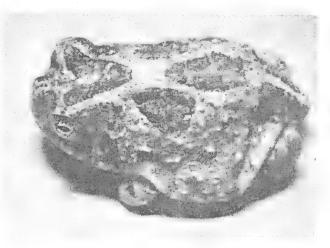
6. LIMNODYNASTES DORSALIS: (80 mm.) — Cooktown



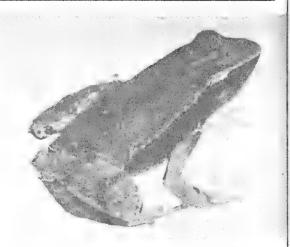
7. LIMNODYNASTES ORNATUS: (35 mm. to 40 mm.) — Laura.



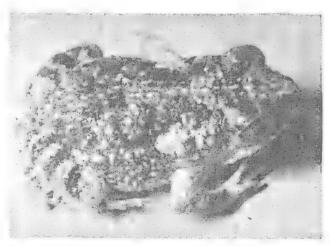
8. MIXOPHYES SCHEVILLI: (93 mm. to 105 mm.) — Cooktown.



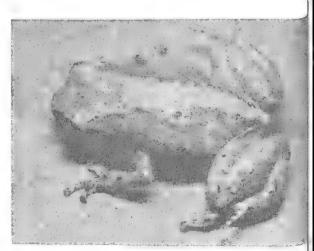
9. NOTADEN MELANOSCAPHUS: (43 mm.) — Edward R.



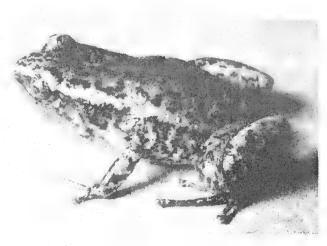
10. TAUDACTYLUS ACUTIROSTRIS: (23 mm. to 30 mm.) — Malanda. (Dr. H. Cogger.)



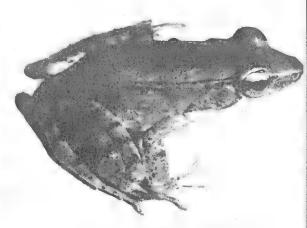
11. UPEROLEIA MARMORATA: (23.5 mm. to 26 mm.) — Horn Is.



12. COPHIXALUS EXIGUUS (18 mm.) — Cooktown.



13. SPHENOPHRYNE FRYI (30 mm.) — Cooktown.



14. RANA DAEMELI (70mm.) — Cooktown.

(All photographs except Nos. 5 and 10 are by F. Parker.)

#### THE

## NORTH QUEENSLAND

## NATURALIST

CAIRNS

Journal of



#### NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS – Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 39

November, 1971.

No. 156.

#### **CONTENTS**

| In Memorium – Hobart M. Van Deusen                  | . Page | 2 |
|---|--------|---|
| The Queensland Mammal Collection of H. C. Raven, —  | /      |   |
| 1921-1922 — Hobart M. Van Deusen                    | . Page | 3 |
| The Little Whimbrel in the Atherton District —      |        |   |
| James A. Bravery                                    | . Page | 5 |
| The Conservation of Mangroves in North Queensland — |        |   |
| E. C. F. Bird                                       | . Page | 6 |

"Each Author is responsible for the opinions and facts expressed in his or her article."

Club Officers - September 30, 1971 to September 30, 1972.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. HUDDY.

Editor: Miss J. MORRIS.

Patron: Mr. S. E. STEPHENS.

FLECKER HERBARIUM: Members are advised that all letters relating to the future of our Herbarium were duly considered in General Meeting. After thorough discussion it was decided unanimously that the Herbarium should be given into the care of the Queensland Forestry Research Station at Atherton. Each sheet may still be identified by the Flecker Herbarium stamp. Thus the extensive collections made by Dr. Flecker and others, and restored and added to in recent years by Dr. Brass and others, have become a large and valued part of the comprehensive Herbarium of North Queensland flora being established at this Research Station.

#### IN MEMORIUM

Leonard John Brass, born 29 May 1900 in Toowoomba, Queensland; died 29 August 1971 in Cairns. Official botanist on the Archbold expeditions to New Guinea in 1933, 1936-37, 1938-39, 1953, 1956-57, and 1959; to the Archbold Cape York Expedition in 1948. He organized and led the Cape York Expedition and three of the four post-war Archbold expeditions to New Guinea. He also made two expeditions to Africa in the late 1940's; these trips were sponsored by pharmaceutical firms. In America he was awarded the degree of Doctor of Science by Florida State University in 1962, an honor richly deserved. He was elected to Honorary Membership in The Explorers Club in 1956.

"Len", as he was known to his associates (and as the "nambawan masta," or "big taubada" to all his New Guinea friends), was a protege of the famous Queensland Herbarium (Brisbane) botanist, C. T. White. Among his peers Len was considered the finest field botanist and collector in the history of Australian botany. His tens of thousands of beautifully prepared and fully documented specimens are admired and cherished in all of the important herbaria of the world. Plant taxonomists will be working on his collections for generations to come. New species and genera of plants, too numerous to mention here, continue to be described by specialists in many families.

But Len was more than a collector. He will be remembered not only for his burning ambition to return to the field regularly, but also for the meticulous organization and planning that went into each expedition. One went "bush" to collect and to observe, and his rigorous routine went on seven days a week, month after month. It was my great good fortune to accompany Len on three major expeditions. I owe whatever professional competence I have in the field to the kind but hard schooling that Len meted out. His expedition "Summaries" are chock-full of valuable information, and are exquisite models of their kind.

Behind his well-guarded reserve was a warm and understanding gentleman.

Eminently fair but firm in all his dealings with the New Guinea peoples, Len had no patience with the kind of administrator who molly-coddled men just emerging from the Stone Age or with missionaries who substituted an empty philosophy for a culture conditioned by centuries of survival competition. He was ever intolerant of slipshod work and thinking, or of actions that detracted from the team effort and spirit so vital to the success of long expeditions. On the rare occasions when Len allowed himself more than one peg of only slightly diluted North Queensland O.P. rum, he would reminisce for hours with his mates about his years on the cattle stations of the Gulf country, his early botanical work in the Solomon Islands and in the scrubs and mountains of the lower Peninsula, and the exciting pre-war explorations of the Fly River basin and the saw-tooth mountains of Papua and Netherlands New Guinea.

Len had a particular fondness for the practically uninhabited Cape York
Peninsula. He began planning the 1948 Archbold Cape York Expedition as soon
as World War Two ended. This trip resulted in collections which were of major
importance to the biological understanding of the role of the Peninsula as a land
bridge between Queensland and New Guinea for the dispersal of both flora and
fauna during prehistoric epochs. Len and I made lifelong friendships on this tripan important reason for Len's decision to live in Cairns after his retirement.
The post of Honorary Curator of the Flecker Herbarium gave Len rich satisfaction.

The one great cross of Len's life was the tragic death by cancer of his lovely wife, Marie, whom he met and married in America. Marie joined the Cape York Expedition at Shipton's Flat during September 1948. She lived at the Archbold Biological Station in Florida, where Len was Curator until his retirement in 1966. Marie died in 1954.

I cannot close this personal recollection without paying homage to the wonderfully kind and generous friends Len cherished in North Queensland. These good people made his last few years so warm and full. Only one word can describe them — they were his "cobbers"!

Hobart M. Van Deusen

## THE QUEENSLAND MAMMAL COLLECTION OF H.C. RAVEN, 1921–1922

In 1921, Henry Cushier Raven, Field Representative of the American Museum of Natural History, began collecting mammals in the eastern states of Australia. During the period 14 July 1921 to 27 January 1923, Raven collected and received as gifts from his many Australian friends 1197 specimens. This professionally prepared and meticulously documented collection, which is housed at the American Museum, is one of the important cornerstones upon which taxonomic studies of Australian mammals have been based. However, this collection is almost unknown to mammalogists in Australia, except possibly through the scientific papers of Dr. George H. H. Tate, who published on some of this material in the 1940's and early 1950's.

Only Queensland collections are discussed in this article, and more particularly those from the northeastern part of the state. Raven also collected in New South Wales and Tasmania. A much more comprehensive review of the complete collection is planned. This will bring all identifications in line with present day taxonomic practice and provide information on the amount and kind of material available for study. North Queensland naturalists will be especially interested in the collection made between the dates of 30

October 1921 and 5 June 1922 at various localities south and west of Cairns. Raven then departed for Brisbane, where he was given a live echidna by the Queensland Museum. He next went to Mundubbera in southeastern Queensland where he collected for several weeks on the property of Lochaber Station. This was his final collecting camp in Queensland.

We do not know whether Raven kept a diary; no such record of his expedition has been found to date. His field catalogue and the specimen labels are the only sources of information available to us at present. A list of his Queensland collecting localities, dates, species and specimen totals is given below. A question mark following the species total indicates that the exact number is not known since the identification of specimens has not been completed. Taxonomic problems are not discussed in this article.

| Locality   | Date   | No. Species    | No. Specimens  |
|--|--|----------------|----------------|
| Babinda Creek                                      | 30 Oct. 1921—<br>14 Nov. 1921                      | 8?             | 59             |
| Dinner Creek<br>(9 miles S.S.E.<br>of Ravenshoe)   | 20 Nov. 1921—                                      |                |                |
| Chillagoe Caves<br>Ravenshoe                       | early Jan. 1922<br>5 & 6 Jan. 1922<br>10 Jan. 1922 | 16?<br>3<br>1  | 166<br>35<br>1 |
| Snubby Creek<br>(6 miles S.W. of<br>Ravenshoe)     | 11 Jan. 1922—<br>15 Feb. 1922                      | 17?            | 97             |
| Ravenshoe  | 22 Feb. 1922—<br>25 Mar. 1922                      |                |                |
| Locality name? (12 miles S.W.                      | (not continuously)                                 | 10             | 23             |
| of Ravenshoe) Kaban Ravenshoe                      | 13 Mar. 1922<br>2 Apr. 1922— 4 Ma<br>April and May | 1<br>y 1922 6? | 1<br>25        |
| Vine Creek, R'hoe                                  | (1 or more days)<br>1922                           | 5<br>1         | 5<br>2         |
| Evelyn (about<br>8 miles N. of<br>Tumoulin Railway | 10 May 1022  |                |                |
| Station) Herberton                                 | 10 May 1922–<br>5 June 1922<br>May (date?) 1922    | 16?<br>1       | 139            |
| Brisbane<br>Mundubbera                             | 29 June 1922<br>2 July 1922—                       | 1              | 1              |
| Locality?  | 28 July 1922<br>No Date                            | 15?<br>1       | 119<br>2<br>   |
| Total specimens                                    |  |                | 676            |

The Queensland collection includes approximately 24 species of marsupials, 6 rodents, 6 bats, platypus and echidna (monotremes). The planned construction of an Australian Hall at the American Museum was the primary reason for Raven's expedition. A representative collection of mammals, with emphasis on monotremes and marsupials, was required both for exhibit and study. This may explain, in part, the low number of bat and rodent species in the collection. Most unfortunately plans for this Hall were abandoned, the victim of the financial crisis of 1929 and the economic depression of the 1930's.

 (Melomys, Uromys) of the rain forest on the lower slopes of Mt. Bartle Frere. In 1948 George Tate and I camped in the cane fields near Junction Creek, just east of Mt. Bellenden Ker, and trapped rodents and bandicoots. Raven characterized Dinner Creek in one of his notes as follows, "for several miles in every direction from this camp there is naught else than virgin tropical forest with more or less dense undergrowth." Snubby Creek is described as an area of "rocky hills." Kaban was the collecting site of wallaroos, rock wallabies, grey kangaroos, and pretty-faced wallabies, so I judge that this is an area of open savannah forest with scattered rocky outcrops. The mammals collected in the vicinity of Ravenshoe indicate that Raven sampled both scrub (rain forest) and savannah habitats; red-legged pademelons from the former, brush-tailed possums from the latter. His collection from Evelyn indicates big scrub for the most part, however, brushtails were taken regularly and one (Sminthopsis) was trapped. An Acrobates is listed from Herberton; this was probably a gift since he noted that the specimen "has been preserved in spirits for some time." When I visited Ravenshoe in 1948 Mrs. M. B. Palmer sold me four pigmy possums that her cat had caught and which were then preserved in "Metho."

Members of the North Queensland Naturalists Club could be of considerable help in this study of the Raven collection by sending me habitat descriptions of the above listed collecting localities, particularly Kaban, Evelyn, Ravenshoe and Snubby Creek. Such help would be gratefully acknowledged in my paper. Is there anyone in the Club who remembers "Harry" Raven, and possibly aided in his collecting on the Tableland?

RAVEN, H. C.

1924 Glimpses of mammalian life in Australia and Tasmania. Natural History, vol. 24, pp. 16-28.

TATE, G. H. H.

1952 Mammals of Cape York Peninsula, with notes on the occurrence of rain forest in Queensland. Bull. Amer. Mus. Nat. Hist., vol. 98. pp. 563-616.

Hobart M. Van Deusen Archbold Collections American Museum of Natural History.

Note: Copies of the American Museum "Novitates" paper by Hobart M. Van Deusen on Chalinolobus, the hoary wattled bat of Queensland, can now be obtained from the author.

## THE LITTLE WHIMBREL IN THE ATHERTON DISTRICT

The Little Whimbrel Numenius minutus is migratory from northern Asia where it breeds during the Artic summer and winters mainly in northern Australia, where huge flocks of many thousands have been reported from time to time. This smaller member of the Curlew family is a fairly regular visitor to the Atherton Tableland during the wet summer months from late November to early March. It visits pasture fields and appears to have strong preference for lucerne areas, especially those invaded by destructive insects such as the smaller beetles Chrysemelidae.

On December 26 1964, a visit was made to a lucerne field adjoining Marks Lane approximately three miles north-east of Atherton. The owner, Mr. Gordon Willets, had informed me that large numbers of Curlew-like birls were frequent-

ing his lucerne field and appeared to be feeding on some species of insect. A search of the field was made by moving slowly through the eighteen inch high lucerne. Three birds were flushed and were recognised as Little Whimbrels, Numerius minutus. Soon after, from a range of about twenty five feet, a good view was obtained of two birds feeding on the small leaf-feeding Beetle Chrysomelidae. Moving through the twenty acre field many birds were seen and flushed. As the birds rose in flight they uttered strong and musical alarm calls somewhat like "keer-quik" repeated several times. As the birds were flushed they gradually built into a large flock which circled the field gradually rising to a considerable height. Again they circled the field coming lower each time and calling, the notes this time sounding like "ti, ti, ti," again quite musical. Soon all the birds landed. and were lost to view. A count taken while the birds were in the air totalled eighty six individuals. Although the birds were wary they were not unduly so, and allowed a close approach and the observer at times had excellent views of the birds resting and feeding. Probably the main feature was the long slim neck and head which was often raised above the herbage to keep an eye on the observer. Like previous sightings the birds showed considerable buffy colour, the crown having a dark brown stripe and the eyebrows were prominent. The tail was short and barred, the bill curved downwards and had a pinkish base. The dark primaries were conspicuous when the birds were about to land. The weather during the week the birds were present in the lucerne field was hot and arid and the ground surface dry.

On February 8 1967, fifty four of this species were seen on the writer's property, and on February 18, 1968, over one hundred birds were in the same field of lucerne. On both occasions small beetles were the major source of food.

On January 21 1969, in company of Dr. F. Leotscher of Kentucky U.S.A., a visit was made to Bonars crossing about five miles north-east of Atherton. On the wet bitumen road half a mile from Tinaroo dam five Little Whimbrels and three Oriental Dotterels Charadrius asiaticus veredus were feeding on the small dark beetles which had been washed on to the road by heavy monsoonal rains. Dr. Leotscher was quite thrilled as both species were new for him and he studied them closely. Especially, the Little Whimbrels gained his attention as they are closely related to the Eskimo Curlew Numenius borealis of North America, now very rare due to hunting pressure while on migration and when wintering on the pampas of South America.

From these brief notes it will be seen that the Little Whimbrel appears to be a regular visitor to the Atherton Tableland during the wet summer months and in such feeding habitats as lucerne fields and tall pastures it could easily be overlooked.

James A. Bravery, Atherton.

## THE CONSERVATION OF MANGROVES IN NORTH QUEENSLAND

E. C. F. BIRD (University of Melbourne)

Most people think of mangrove swamps as uninteresting and unproductive places; as nothing more than waste land awaiting reclamation for some useful purpose. Until recently the only people who might have dissented from this view would be those biologists who recognised mangroves as having scientific interest, especially the physiological adaptations of mangrove plants to the intertidal

environment. It has also been observed that the mangrove community as a whole is ecologically rich, sustaining associated populations of mud-burrowing fauna, including crabs and prawns, together with oysters and barnacles that adhere to the roots and trunks of mangrove trees, birds, including cormorants, herons and ibises, that live amid the foliage, the notorious biting insects, and the occasional crocodile.

But in recent years, research in various parts of the world has shown that mangrove communities are more important than was previously thought. On the one hand they act as land-building and shore-protecting agents; their root structures (the vertical breathing-tubes, or pneumatophores, of Avicennia and the proproots of Rhizophora) serve to trap and stabilise muddy sediment that would otherwise remain drifting to and fro in suspension, thus building up new depositional land and the same time protecting the shore from ordinary wave erosion. This has become most obvious when the clearance or destruction of a mangrove fringe has resulted in the erosion of land that had formerly been built up, leading in turn to the shallowing of bays and estuaries and the siltation of navigable channels, with increased expenditure on draining and maintaining port approaches.

On the other hand, mangrove swamps have been shown to function as 'ecological engines' which concentrate, process and transmit the nutrients that go to sustain the biological communities - especially fisheries - in coastal waters. This is why estuarine fisheries are usually so productive. In Moreton Bay the Head of Fisheries in Queensland's Department of Harbour and Marine has assessed the income received from exploitation of fishery resources nourished from the bordering mangrove swamps and calculated that the mangroves, far from being useless, are actually yielding net return of about \$300 per acre per year. Similarly, the mangrove swamps of North Queensland must be contributing nutrients to coastal waters and helping to stabilise the shoreline.

Conservationists are now beginning to urge that we recognise the value of mangrove swamps, that we stop thinking of them as 'land ripe for reclamation'. and that we see that they are cleared or destroyed only where there are really good reasons for doing so. There is no point in obliterating a mangrove swamp to build an Angler's Paradise of real estate if this is going to impoverish the fishery. When reclamation of part of the mangrove swamp is unavoidable, the work should be done carefully, with the aim of minimising disturbance to adjacent mangrove areas. In local terms, this means that further reclamation for dock and harbour construction at Cairns should be planned and carried out with great care, in order to conserve the mangrove fringes of Trinity Inlet and Admiralty Island. If they were lost, vast quantities of mud would be released into Trinity Inlet and the maintenance of Cairns Harbour would inevitably become more difficult and costly than it is now. Moreover, the dark green mangrove fringe is scenic asset, and it is still possible to catch fish in Trinity Inlet: Unfortunately, there is not yet a Nature Reserve hereabouts, though Admiralty Island would be an excellent place for one, with many of the feautres that attract visitors to the Everglades National Park in Florida.

Dumping of garbage and earth fill from the landward side is also a threat to mangrove swamps. Few projects could be less wise, in the present state of the sugar industry, than the destruction of part of a valuable fish-sustaining mangrove swamp in order to reclaim land to extend the sugar acreage!

The problems of mangrove conservation must be looked at on an Australiawide scale. Mangroves occur right round mainland Australia, but are very sparse and scattered on the southern and western coasts of the continent. In Victoria there is only one mangrove species (Avicennia marina), forming a scrubby fringe on the shores of estuarine areas, such as Westernport Bay; but even here the mangroves are important as agents of land building, shore protection, and ecological stability. On the east coast the number of mangrove species increases from one on the South Coast of New South Wales to nine in the Brisbane area, and more than-twenty in North Queensland. (see Macnae, Australian J. Botany, 1966). The widely-held belief that there are vast areas of inaccessible, undisturbed, natural mangrove swamp in northernmost Australia is, unfortunately, a myth. The shores of the Gulf of Carpentaria, of Arnhemland, of Van Diemen Gulf, and of the north-west are predominantly sandy and rocky, and where mangroves do occur they are often no more than a narrow fringe, backed by salt plains and wet marshland. Only locally (as in the Darwin area) are the mangrove swamps on as large a scale as those of North Queensland. The most extensive, most luxuriant, and most varied mangrove swamps in Australia are found on the humid tropical sector of the North Queensland coast, between Townsville and Cooktown. The finest samples are found on Hinchinbrook Island, and alongside the Hinchinbrook Channel: on the shores of Rockingham Bay: near the mouth of the Tully River: around Mourilyan Creek and Nind Creek near Innisfail: at Mutchero Inlet: in Cairns Bay and Trinity Inlet: at the Mowbray River mouth: close to Port Douglas. and alongside the lower Daintree River. Typically there are distinct zones, often Avicennia on the seaward fringe, followed by Rhizophora, then mixed mangrove communities with Bruguiera, and Ceriops species, with swamp paper-bark forest, and sometimes a transition to rain forest, at the landward margin. Farther to north and south the dry season lengthens and annual rainfall totals diminish; correspondingly, mangroves become less extensive, less varied, and less luxuriant, and enclaves of salt marsh and saline flat develop. Small enclaves of this kind are even present on Admiralty Island, and amid the mangrove swamps south of Trinity Inlet, indicating the locally drier conditions in the 'rain-shadow' of the Malbon Thompson Range.

There are many ecological problems to be solved in the North Queensland mangrove swamps. No doubt there is much local information on which detailed studies could be based. My own interest is primarily in the geomorphology of the coast, but I had many useful discussions with Dr. L. J. Brass, who knew a good deal about local mangrove swamps; the last such discussion took place one evening in August, when I visited him in the Cairns hospital, carrying a bouquet of plants collected that day from Admiralty Island. Though obviously very sick, his interest in mangroves (including his experience of Florida mangroves) was just as evident as on earlier occasions: he identified most of the plants for me, and commented that it would be valuable for visitors such as I if the Herbarium could provide a reference collection of these coastal species. Unfortunately, Dr. Brass has since died, and North Queensland has lost one of its foremost mangrove enthusiasts.

Obviously we should have Reserves protecting the best and most interesting of the North Queensland mangrove communities. Back in 1966, Dr.L. J. Webb published a study of habitat types in the wet tropical lowlands of North Queensland (Proc. Roy. Soc. Q'land, 1966). He recommended the establishment of 20 National Parks and Scientific Reserves in the coastal sector between Ingham and Cape Tribulation, three of which (Hinchinbrook Channel area, mouth of Russell River, and south of Daintree river mouth) included substantial mangrove areas. It may well be that further ecological studies would lead to recognition of additional mangrove swamp samples worthy of conservation in Reserves: those of Admiralty Island and Trinity Inlet, the mouth of the Mowbray, and close to Port Douglas deserve particular attention.

As well as preparing the way for the establishment of Reserves containing mangrove communities, we have to publicise the importance of mangrove conservation. The recently published Viewpoint on Mangroves put out by the Australian Conservation Foundation will be useful here. Both aims fall within the declared objectives of the North Queensland Naturalists Club.

#### THE

## NORTH QUEENSLAND

### **NATURALIST**

CAIRNS

Journal of



#### NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30):

City and Suburban Members, \$2.50.

Country Members, \$2.00

Junior Members, 50c.

Vol. 39

April, 1972.

No. 157

#### CONTENTS

| News & Notes — Correspondents                       | Page 2. |
|---|---------|
| Bulimba Fauna Sanctuary                             | Page 3. |
| An Amateur Naturalist in New Guinea                 | Page 3. |
| Recent changes on the Shoreline of the Barron River | Page 6. |

"Each Author is responsible for the opinions and facts expressed in his or her article."

Club Officers - September 30, 1971 to September 30, 1972.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. HUDDY.

Editor: Miss J. MORRIS.

Patron: Mr. S. E. STEPHENS.

NEWS & NOTES: The late Dr. Brass generously bequeathed his binocular microscope to our Club, also a bookcase and a filing cabinet.

A Club member recently visited the Forestry Research Institute at Atherton and reports that the Flecker Herbarium is being well cared for there.

The Treasurer requests that all outstanding subscriptions be paid forthwith.

The Editor requests many more contributions for our Journal.

The following people would like Australian correspondents in the subjects stated:

- Mr. C. C. Chua, P.O. Box 12, Tabah Rata, Cameron Highlands, Pahand, Malaysia. *Butterflies, moths, beetles, insects generally*.
- Kevin Donohue, 7 Harrington Avenue, Coriland, New York 13075, U.S.A. Insects generally.
- Mitsui Nomoto, 129 Umaki-cho, Matsuyama City, Japan. Butterflies.
- Fumio Miyasaka, Box 66, Ueda City, Nagano, Japan. Butterflies.
- Takashi Hosono, 1, 11-chome, Denenchofu honcho. Ota-li, Tokyo, Japan. Butterflies.
- Takayoshi Matsumura , 827-5 Fujioka, Fuyioka-shi-Gumna 375, Japan. Butterflies.
- J. Haugum, Lunhusvej 33, 7100 Vejle, Denmark. Butterflies

### **BULIMBA FAUNA SANCTUARY**

In April 1970, the Bulimba cattle station on the Lynd River was declared 

Fauna Sanctuary as a result of representations to the Minister for Primary Industries by the owner of the property, Mr. E. Cunningham.

Mr. Cunningham kindly supplied the following information about this

Sanctuary for our Journal:

Bulimba is a very remote property lyin g on both sides of the Lynd River. Scattered all through the area are great big deep lagoons and swamps. These are ideal habitats for all manner of wild life such as geese, ducks, ibis, native companions (brolgas), jabiru, and numerous other wild birds. The station manager is Ranger and as such has complete authority to report anyone violating the sanctuary. It is felt that now they cannot be disturbed these wildfowl will breed in ever increasing numbers.

Should the property ever change hands the sanctuary would remain and it is most probable the new owner would agree to act as Ranger. Should this not be the case, the Lands Department would then appoint some other

responsible person.

With Bulimba as a sanctuary Mr. Cunningham feels that the wild life of the Peninsula is now in no danger of extinction.

### AN AMATEUR NATURALIST IN NEW GUINEA

#### FROGS:

A giant tree frog up here measures about 5½ inches in body length and about 10 inches with back legs extended. Colouring is deep green on top, white underneath with just I faint touch of yellow. The face is flat, the body very thick through. It has a very deep rattling voice which fortunately is not used very often. Up at Wau I found ■ small tree frog, brown with orange stripes down each side, that had a voice like someone striking an anvil. Another one was always belching politely - after each belch I fully expected to hear a small voice say: "Pardon!" On top of Mt. Kiandi, 8,000 feet up in moss forest, and always under logs, were two species of very small frogs about 1 inch in length that were quite beautifully marked like small jewels. The last frog I found back in Lae, right under the house. It was 11/2 inches long, with small black granules on the back. It had the loudest voice of any frog I know, a series of high pitched 'beep-beeps" which it kept up all night. It was impossible to sleep with one of these under your room, so I crawled under, to emerge after fifteen minutes with the offending frog, then was just sitting down when another started. Cursing, I spent a further half hour searching and finally caught it. Rod then let them go across the road. Naturally the following night we were once more deafened by "beep-beeps". After capture this time the frog was set free miles away. These frogs were very common.

### REPTILES:

The natives usually kill any snakes they find. We have seen a black-headed python, what appeared to be two brown snakes, and perhaps a whip-snake. Then a native brought us a beautiful green python. It was green on top and sides blending into yellow with whitish underbelly and mauve speckles splashed along the sides - simply gorgeous in the sunshine. The natives let it go into the bush. We have seen a lovely tree goanna, 3 feet long, bright green with white speckles all over, climbing all the way up at tree. There are green skinks easily 1 foot long and others with blue tails. Across the Markham River I found pecko under some bark, as large as our leaf-tailed gecko, with beautifully patterned eyes and markings of chocolate brown, deep grey and a black patch on the back.

In a quiet clearing I heard in the distance what I took to be meavy wind. Closer and closer it came, a strange soughing pulsing sound of heavy objects beating through the air. Then over the treetops came fifteen large birds. As soon as I saw the bills, heavy and downcurved with meare carbuncle-type protuberance at the head, I knew they were hornbills. They were black except for white tips on the huge beating wings and long tails. Altogether three flocks totalling about thirty birds flew over the

clearing.

Another day up at Wau I went round the mist nets with Peter Shanahan's boys. Peter collects birds for overseas zoos. A few birds in the nets were gently put into cloth bags. On our return down the ridge, the leading boy stopped, silently beckoned me forward and pointed to largish tree on the outer jungle wall. Onto branch right in front hopped king bird of paradise. He was small with pure gleaming white breast and neck, his head and all his back flaming scarlet, and two lyre-like green feathers extending from his tail. These bobbed up and down as he hopped around, busily peering into loose bark. Suddenly he was still, peering intently, his head weaving this way and that. Then in a red flash he was gone. I shall never forget that bird.

Going down a track on Mt. Kiandi I heard strange cry, a kind of rapid chattering after the style of a machine gun, which I realised I had heard before on one of my records at home. It was the call of a Sicklebill bird of paradise. I hurriedly focused my binoculars on the nearest tree and there in the shadows was the male. Black with white splashes on wings, mottled breast, he had a long tail from which protruded two longer white feathers that streamed behind him when he flew. He sat there absolutely still, eyeing me inquisitively. Another shadow joined him, his rather drab wife. Both had long thin down curved beaks, like the rifle bird. We must have stared at each other for ten minutes before they unhurriedly flew away. This same day in the moss forest I saw yet another bird of paradise the Magnificent. I managed to see the yellow feathers of his back and he appeared to have greens and browns on black. One moment he was on a branch, the next gone.

I saw some tree creepers with black caps scaling the trees, and two New Guinea versions of the golden whistler flitting round on the moss covered boughs. A party of large black birds with bare yellow faces came slowly through the trees, foraging up and down the branches - a type of honeyeater. Later I came upon two grey mottled birds, the size of rifle birds and with similar bills, which were really tearing into an old tree, bark flying everywhere. Small all black parrots shot rapidly amongst the trees, possibly a species of fig parrot.

Another day on Mt Kiandi I came upon some mistletoe with bright orange blossoms on which half a dozen dainty little honeyeaters were feeding. They had coal black plumage with a scarlet splash across back and head. Also at this place I saw one of the New Guinea yellow robins, the yellow very faded out with the same gentle nature and friendly eyes.

### **INSECTS ETC:**

Rod and Joan took me out to meet some of their boys who had been collecting specimens for them. We left the car in small clearing surrounded by semi-jungle and wended our way along path until we came out onto river. Now crossing this river was what Joan and Rod, in the understatement of the year called swinging bridge. They assured me they had crossed it before. I followed Joan awkwardly up a series of wooden slats or branches, going almost on all fours as there was nothing to hang onto. On getting up to the top and watching Joan commence her swaying progress across, I turned a pea green and decided definitely that this was not for me. Ignoring rude remarks from Rod I tottered down to the ground, took my boots off and waded across the treacherous current that swept strongly round my ankles.

On the other side we met the boys at their home under some palm trees. They and their friends from the village welcomed us and they brought out their hoard. Michael had collected on a vine two chrysalises of the black and yellow birdwing, but best of all was a giant green katydid, It was so like a leaf that at first it did not register on us. The wings had the veins and arteries of the usual leaf as well as camouflage splotchings that from a distance resembled holes or fungus spots. It was 5½ inches long and 1 1/4

inches deep, truly magnificent specimen.

Going back I once again forded the raging torrent, stopping in mid-stream to watch the slow progress of Joan returning over the bridge. Cautiously inch by inch she stumbled and tripped, grabbing tightly the cables on each side. In fact so hard was she concentrating on crossing and keeping her balance that she almost knocked a smiling native off the end as she stepped off. She did not know anyone was there until he spoke to her. I think that the only

reply he got was a small Ishriek.

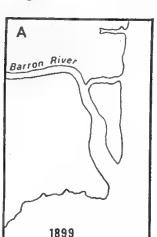
The beetle collecting I would say has been fairly poor, although I will end up with a little over two thousand beetles. I have been here during the dry season - though it rains almost every night. The wet season should start in April or May. I have met many interesting people and have enjoyed every moment of this trip. From spiders and birds to snakes and giant millipedes that grow to over a foot long (pick up these last with care they secrete some solution that burns the skin, causing it to peel off): in a new country everything that moves is interesting.

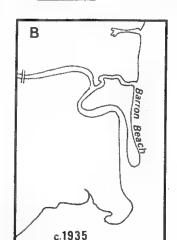
E. C. F. Bird

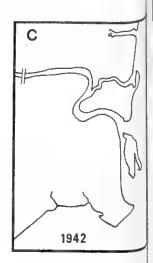
# RECENT CHANGES ON THE SHORELINE OF THE BARRON DELTA

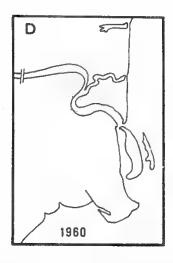
(University of Melbourne)

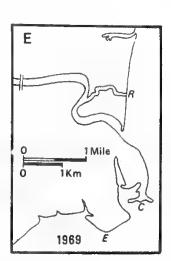
Figure 1.











The coastal lowland north of Cairns consists of the delta built up by the Barron River, which has brought down large quantities of sediment (chiefly sand, silt and clay, with some gravel) from its catchment on the Atherton Tableland. Rivers in delta regions commonly branch into several distributary channels, and the Barron is no exception. Thomatis Creek, leading into Richter Creek, is one distributary, and Redden Creek, opening on to Machan's Beach, is another. Barr Creek, at the northern end of Machan's Beach, marks the site of a third, no longer linked to the Barron River.

As deltas develop, these channels tend to migrate, and change in size. Most of the water and sediment now discharged by the Barron flows down its main channel, under the road bridge at Stratford and out to the sea at the southern end of Machan's Beach, but at earlier stages in delta development the main outflow was at times by way of Richter Creek, and at times by way of what is now Redden Creek. At one stage, the Barron flowed into Cairns Bay somewhere near the Airport.

These past changes have been deduced from studies of the surface and sub-surface deposits of the delta region (Bird 1969, 1970), but even within the past century there has been a major change in the outflow from the Barron River. Evidence of this can be obtained from comparison of early maps and charts with the more recent configuration shown on air photographs (Figure 1).

Cook and Flinders both sailed past this sector of the coast without pausing to examine it, but Philip King visited Trinity Inlet in 1819, and thought it to be the mouth of a large river. Owen Stanley agreed with this view when he visited the area in 1848, but when Dalrymple explored Trinity Inlet in 1873 he found that it led only into branching and narrowing mangrove-fringed tidal creeks. None of the early visitors seems to have noticed the mouth of the Barron River, though it must have been known to the first settlers, who arrived in Cairns in 1876. It was marked on Lieutenant Connor's plan of Cairns Harbour, prepared in 1878, in a position adjacent to Ellie Point. A map of Cairns and surrounding districts published around 1885 (kept in the Queensland Archives) also shows the Barron opening in this position, but it labels Ellie Point erroneously as Casuarina Point. The first reliable map of the lower course of the Barron River is the chart of Cairns Harbour surveyed by Commander Parry in 1899. The configuration at that stage is shown in Figure 1, a.

In the early years of the present century there was an uninterrupted beach extending from the mouth of Redden Creek southward to end in spit flanking the outlet from the Barron. This was known as Barron Beach (Figure 1,B). By the mid-nineteen thirties there were several dwellings on the sandy country immediately behind this beach, and two of the people who lived there (Mr. F. G. White and Mrs. B. Brown) have supplied the author with local information. Year by year, the Barron River sharpened its meandering channel, encroaching on the narrow strip of coastal land. The sandy isthmus was almost breached during the 1934 cyclone, when heavy seas pounded the shoreline at the same time as floodwaters poured down the Barron River. The actual break-through seems to have taken place a year of two later, probably in 1937. A wide new outlet was soon formed, and shoals began to accumulate across the old channel.

This was the situation when air photographs were taken in July 1942 (Figure 1,C). Extensive shoals of sand which had formed south of the new outlet were probably derived mainly from the washed-out sector of Barron Beach, though additional sand may have come down the river at this stage. Subsequently, a large sandspit has developed south of the new outlet (Figure 1,D) culminating in Casuarine Point, and the old channel has been sealed off by a tract of mangrove swamp, so that by 1969 it was no more than a blind inlet between Casuarina Point and Ellie Point (Figure 1,E).

The sandspit at Casuarina Point is a fine example of a recurved spit. The dominant longshore drift on this sector of the coast is southward, because waves produced by the prevailing south-easterly winds are usually weak in the lee of Cape Grafton peninsula. Waves from the north-east are moving sand down the coast to Casuarina Point, but occasional strong southerly winds, coinciding with high tides in Cairns Bay, bend back the southern termination of the spit to form recurves. These are usually directed landwards, but at times there is also a seaward projection of sand, giving the spit a 'hammer-head' appearance.

When the Barron mouth lay near Ellie Point, the river supplied sand to build a recurved spit there. Once it changed its course, the sand supply was cut off, and mangroves began to colonise the mud in front of the sandy beach. There is still lateral growth, however, at the western end of Ellie Point beach, where a small sandspit is fingering into the mangrove swamps that fringe the northern shore of Cairns Bay. If the mangroves continue to spread they will eventually enclose this recurved spit, and its growth will come to an end. There is nothing new in this, for the mangrove swamps of the Cairns district already enclose several such 'dead' spits, relics of earlier phases of sand supply when the river mouth lay in other locations.

The evolution of the Barron delta has certainly been complex, and the changes that can be demonstrated from historical evidence within the past century are simply the most recent variations in physiography. In the future, it is likely that Casuarina Point will continue to extend, and that mangroves will advance further on to the muds accumulating in Cairns Bay. It is possible that the Barron River will again change its course — or that engineers will find it necessary to divert the outlet to some other position, perhaps as a means of delivering sand to replenish the eroded shoreline at Machan's Beach.

### References:

Bird, E. C. F. 1969 The deltaic shoreline near Cairns, Queensland, Australian Geographer, vol. 11, pages 138-147.

Brid, E. C. F. 1970 Coastal evolution in the Cairns district, Australian Geographer, vol. 11, pages 327-335.

Figure 1. In panel E, R indicates Redden Creek, C Casuarina Point, and E. Ellie Point.

G. K. Bolton, Printers.

## THE

# NORTH QUEENSLAND

# **NATURALIST**

CAIRNS

Journal of

## NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS – Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30):

City and Suburban Members, \$3.50

Country Members, \$3.00

Junior Members, \$1.00

Vol. 39

August, 1972

No. 158

## CONTENTS

| Life History of ASCELES POMEFORMES |         |
|------------------------------------|---------|
| Maker of the Bloodwood Apple       | Page 2. |
| The Beach-Ridge Plain at Cairns    | Page 4. |
| Reference Map                      | Page 7. |

"Each Author is responsible for the opinions and facts expressed in his or her article."

# <u>LIFE HISTORY OF - ASCELES POMEFORMES - MAKER OF THE BLOODWOOD APPLE</u>

Since man began to leave his cave dwellings and migrate to areas of the Earth that had no such ready-made shelter, he has used a wide range of materials to protect him from the elements and wild beasts. Today we have, spaced around the world, crude structures of leaves and branches, huts of mud, and on up to palaces of marble. In his long career from caves to cathedrals, the son of Adam and his little woman have never been able to provide food and shelter for themselves and family by biting into a convenient tree and injecting it with their saliva.

Asceles pomeformes is an insect whose females do this, and do so with the initial handicap of starting food production and house building while still infants.

At this stage the little insect resembles a tiny mite, less than ½ mm. long, wingless, with minute eyes and antennae, six microscopic legs, and a proboscis much thinner than a human hair. She thrusts her thin proboscis through the bark of a twig or small branch of ■ species of Eucalypt (bloodwood), and within a week a rough circular crater is rising around her body, which will, in a few weeks, completely enclose her in ■ roughly spherical gall formed from the tissues of the plant on which she is feeding.

During this period a drastic change takes place in her body. The eyes and all appendages except the proboscis are lost and she is now like a small spherical pearl coloured berry. She still has her proboscis inserted in the plant tissue and will remain so anchored for life. The gall is growing rapidly, is assuming a more evenly rounded contour and is forming a conical tube in its wall which fits around a hard blackcone-shapedplug that is now forming on the insect's posterior. This conical tube is the only opening in the gall to the outside world and is probably means of air control; through it she is presumably mated, and I have observed the emergence of the brood through this passage.

For some time the gall and its contained insect keep pace in growth, with the insect's body in firm contact with the inner surface of the gall. Her body is still spherical but the growth of the conical plug now gives her a broad top-shape. After this there is an increasing difference in growth rate with a gradually enlarging space around the insect's body, except at the feeding point and at the conical rear end which remains a close fit in the tube-like opening of the gall.

Small holes now appear on the rear half of the insect's body and around these a white chalky substance and small bundles of coiled cotton-like material accumulate. This may be a form of excretion as the latter material is also produced by the immature males that develop later in the parent gall, but this has not been observed in immature females prior to emergence.

The outside of the gall now has the shape of a small apple of a brown to grey-green mottled colour, with a conical pit in its outer surface opposite its point of attachment to the tree. This pit is the outer opening of the tube mentioned above and, in a healthy gall, the black plug-like cone on the insect's body can be clearly seen protruding into this pit.

When a few millimetres of space have formed around the insect, the first eggs are laid and these produce almost entirely males. When hatched, these juvenile males are about ¾ mm. by ½ mm., colourless, with a tapering body, stumpy legs, rudimentary antennae and eyes, and a proboscis less than 1/50 mm. in diameter. They commence feeding on the inner surface of the gall and grow rapidly, attaining a length of about 3 mm. and a diameter of 1 mm. by the time they finish feeding. As they grow the males become carrot-like in shape and colour and are tightly packed around the inner surface of the gall with their pointed rear ends to the centre, across which, like a huge grey sausage, lies the gigantic body of their mother.

Before the males have finished feeding, a second batch of eggs is laid and these produce females with a very few males. The juvenile females are almost colourless on hatching, with a faint brown longitudinal band on the back. They are mite-like, less than ½ mm. long, and very active. They move to the inner sufrace of the gall among the males and commence to feed.

The males cease feeding soon after the females begin and lie loosely in the gall around the body of their mother while undergoing moulting. They moult once only, a rare thing in the insect world. The metamorphosis of the juvenile male to the adult is almost as striking as the change of a caterpillar to butterfly or moth. A helpless carrot-like creature with minute eyes and antennae and short, almost non-functional legs, changes to an agile winged insect with huge thorax, a long slender tapering abdomen, strong legs, large eyes, complex antennae, and a pair of large membranous wings. The abdomen is very flexible and is extensible by about one third of its length. It is more like a tail than abdomen and is held well clear of the surface when the insect is walking. The mouth parts of the mature males are aborted; they cannot feed.

The juvenile females feed while the males are moulting and for a short time afterwards. Growth is negligible and can only by detected by microscopic examination, and they are still less than ½ mm. long when they emerge from the parent gall. Their colour deepens to brownish black on the back and light brown at the sides.

The brood disperses from the maternal gall by the males taking flight with the tiny females clinging to their tails. From one to seven of these midget females have been observed on the abdomens of males prior to taking flight. Emerging insects have been taken in glass tubes in the field and examined on the spot with a hand lens, and every male carried one or more of these infant hitch-hikers.

Field observations indicate the lifespan of a gall is from 18 to 26 weeks, with a good deal of overlapping in that healthy galls at nearly all stages of development may be obtained throughout the year but are more plentiful during the wetter months. A very high percentage is destroyed by parasites and predators; some are killed by fungi, others by several species of beetles and wasps.

Mature galls examined had outer diameters from 22 mm. to 90 mm. but size variation in the insect's body was not proportional to that of the gall. The smallest mature female was 14 mm. and the largest 27 mm. long. The maximum volume of the largest of these galls could be more than 100,000 times that of the insect at commencement of gall formation, and the size of the mature insect less than 1/25 that of the mature gall. Rough checks of progeny in healthy galls gave a variation from about 1,700 to 4,600 males with slightly more females.

The great difference in development of the sexes on emergence from the gall (the fully developed male with his aborted mouthparts, carrying his baby sisters into a hostile world), and the time taken for the females to reach maturity, suggest that the males may mate with a previously established generation of females.

The life history of the insect outlined above, with its remarkable change in form and enormous increase in volume, its specific and precise control of the growth and shape of the gall, and the strange journey of the females to the outside world clinging to the "tails" of their huge winged brothers, is one of those fascinating highlights of the living world when Nature sings a more wonderful song or tells a more marvellous tale.

N. C. Coleman.

### THE BEACH-RIDGE PLAIN AT CAIRNS

E. C. F. Bird

### (UNIVERSITY OF MELBOURNE)

The coastal plain on which Cairns stands consists of numerous sand ridges with intervening hollows (termed swales), many of which contain, or used to contain, corridors of swamp land. In the city area, around the railway station, and along the waterfront the original topography has long been concealed by infilling and building, but in the northern and western suburbs the trend of the ridges and swales can still be discerned. The sand ridge topography was closely surveyed during the nineteen-forties, when large-scale plans (1 inch = 200 feet) were prepared for the City of Cairns Anti-Malarial Drainage Scheme. These plans cover West Cairns and part of the Bungalow district, and show contours with a one foot vertical interval. The contour patterns are extremely intricate, but the alignments of ridge crests can be picked out, and these have been abstracted to show the ridge system in Figure 1.

The cross section in Figure 1 shows that the ridges are not evenly spaced. Some of them branch, and others fade away laterally. The contouring was based on an arbitrary levelling datum, but in preparing Figure 1 this was converted to State Datum, equivalent to mean sea level at Cairns, Harbour. Spotheights show considerable variation along the crest of each ridge, with a range from 5 to 14 feet above mean sea level and a typical maximum elevation of 10 to 12 feet. Intervening swales (not shown) range from 3 to 7 feet above mean sea level, and parts of these are invaded by the sea during the highest spring tides, which attain almost 5 feet above mean sea level at Cairns.

The pattern of sand ridges in the area not covered by the large-scale plans has been mapped by field survey and on air photographs, and the results have been included in Figure 1. In the Bungalow district the sand ridges decline in level and fade out into the mangrove swamps bordering Trinity Inlet, while to the north-east, beyond the watercourse that follows the railway line and flows into Saltwater Creek, another series of parallel ridges lies concealed beneath the built-up area of Cairns. These were somewhat lower (typically up to 6 feet above mean sea level) and more subdued in profile than those of West Cairns.

Their alignments have been taken up by Sheridan Street, Grafton Street, Lake Street and Abbott Street, and a walled esplanade forms the seaward margin, which was mangrove-fringed when the first settlers came to Cairns in 1876.

Continuations of the sand ridges can be traced on Admiralty Island and in the swamps south of Trinity Inlet, marked out by the presence of Eucalypts and other trees and shrubs that contrast with the prevailing mangrove vegetation.

These ridges have been dissected by the lateral meandering of tidal creeks, and one of them is being actively truncated near the Bark Hut, where a sector of sandy shore is exposed on the south bank of Trinity Inlet.

### Geology.

The surface formation on the Cairns coastal plain consists of up to 14 feet of quartzose sand, with occasional pebbles and shells, underlain by a soft bluegrey clay formation containing relics of ancient mangroves. This has been demonstrated by the numerous boreholes sunk in the Cairns area to explore foundations for building construction. The soft clays thicken southwards, reaching a depth of 78 feet below mean sea level at the sugar terminal bordering Trinity Inlet. Underneath them is a firm yellow-grey clay formation up to 40 feet thick, which rests in turn on a basement of sandy gravel.

To interpret this sequence it is necessary to appreciate that sea level has risen and fallen several times around the Australian coast during the past million years. Episodes of lowered sea level coincided with the colder phases of the Pleistocene, when ice sheets and glaciers became much more extensive on the Earth's surface than they are now. In the last major cold phase — about 20,000 years ago — sea level stood 300 to 400 feet lower than it is now, and rivers extended their courses out over the emerged sea floor to shorelines that have since been deeply submerged. In North Queensland the Barron River is thought to have flowed out through the gap in the Great Barrier Reef known as Trinity Opening — and at this stage the Reef stood up as a chain of limestone ridges at the outer edge of a broad plain. In the ensuing period the sea rose rapidly, attaining its present level some 6,000 years ago, since when there have been only minor oscillations.

Underneath Trinity Inlet there is a deep trench, now largely filled with muddy sediments, which is thought to have been excavated by the Mulgrave River during one of the low sea level episodes in Pleistocene times. The fact that it is now filled with muddy sediment washed in from the sea rather than by alluvial sands and gravels of the type carried by the Mulgrave indicates that this river had been diverted southward to its present outlet at Mutchero before the last rise of sea level. The deep blue-grey clay formation and the sands that rest on top of it in the Cairns district have accumulated during and since this last sea level rise: they are derived from sediments supplied by the Barron River, which drains to the sea just north of Cairns, and not from the Mulgrave (Bird 1970).

Supporting evidence of the age of the coastal plain deposits at Cairns has been obtained by means of radiocarbon dating of shelly material taken from the base of the innermost (i.e. oldest) sand ridge. This yielded an age of 5530  $^{+}$  130 years Before the Present, and since in radiocarbon dating the Present is taken as 1950 A.D. this represents a calendar date somewhere between 3710 and 3450 B.C., some centuries before the dawn of ancient civilisations in Egypt, Mesopotamia, India and China. It is not known how long the Cairns ridges took to form, but it seems likely that they were built up successively over a period of many centuries.

### Origin of the sand ridges.

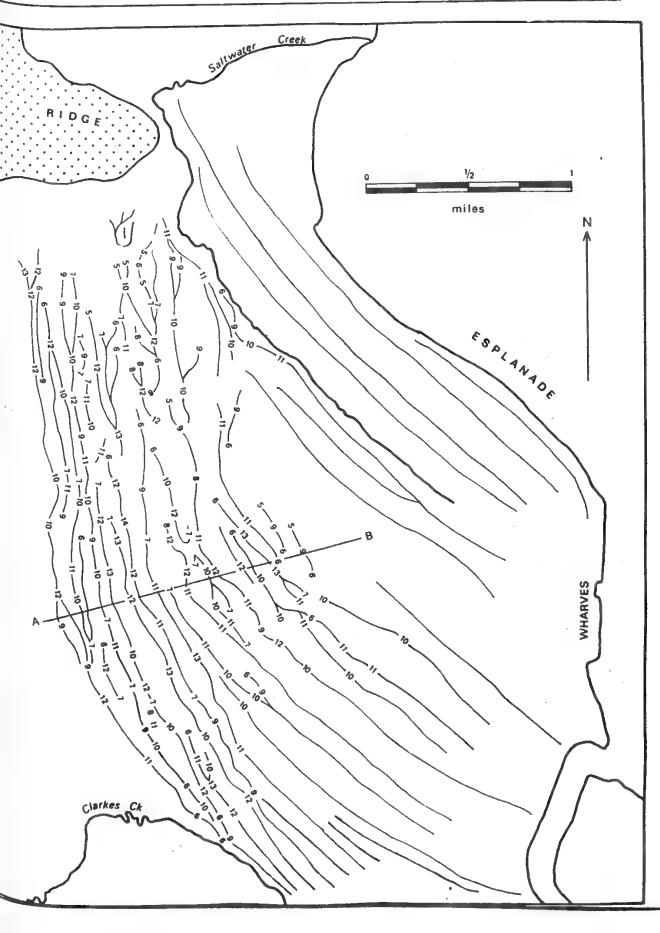
Examination of the form of these ridges and their rough parallelism with the present shoreline suggests that they were built by wave action, and this is confirmed by their internal structure, which shows laminations of the kind found on modern beaches. The ridges are thus beach riridges, produced by wave swash. Some have a thin capping of wind-blown sand, but in general the crest of the ridge represents the limit reached by wave action. In detail there are relics of transverse runnels and washover fans.

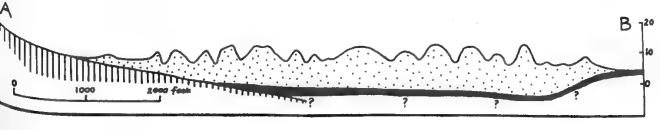
The closest analogy at the present time is the ridge of sandy material that extends south from the mouth of the Barron River to end in the spit at Casuarina Point. This beach ridge has been formed by southward drifting of sand from the river mouth, due to the action of waves coming in from northerly and north-easterly directions. Its crest marks a swash limit about 1 foot above the level of the highest spring tides. A similar feature at Ellie Point ends in a sand spit fingering into the mangrove swamps, extending each time wave action accompanies a high spring tide.

The sand (and occasional pebbles) in the Cairns beach ridges is similar in composition to the sand and gravel carried downstream by the Barron River; it consists mainly of quartz, with some felspar and fragments of metamorphic rock. When the beach ridges were being built, the mouth of the Barron must have been somewhere in the vicinity of the Airport. During each flood, quantities of sandy sediment were delivered to Cairns Bay, and wave action subsequently drifted these southwards across the mudflats and mangrove swamps. The completion of each ridge was marked by an episode of storm wave action, presumably generated by occasional cyclones, when the sand was piled up at the back of the shore. Subsequently a new ridge would start to develop in front of this, until eventually this too was piled up by storm waves. The sequence went on until the Barron River changed its course and began to build its delta out towards Machan's Beach, where similar parallel ridges were formed. Once this change had happened, Cairns Bay no longer received sandy sediment, and the construction of successive beach ridges came to an end. Deposition of mud continued, however, building up the extensive mudflats in the Bay, and preparing the way for mangroves to advance from its bordering shoreline.

The crests of the older beach ridges in West Cairns are typically 10 to 12 feet above mean sea level, whereas the outer ridges between the railway and the esplanade reached only about 6 feet, equivalent to the height of the modern beach ridge at Casuarina Point. It may be that sea level was slightly higher when the older beach ridges were under construction, and that it fell back to its present level by the time the outer ridges were added. There is a good deal of evidence in North Queensland, in the form of raised beaches, and emerged shore platforms, coral reefs and beach rock, suggestive of such an episode of sea level a few feet above the present some 4,000 to 6,000 years ago.

Beach-ridge plains of the type seen at Cairns are found on several sectors of the North Queensland coast, especially near the mouths of the larger rivers such as the Burdekin (Hopley 1970). They have also been studied on the east coast of Malaya (Nossin 1964) and in Mexico (Psuty 1965), and seem to be characteristic of low wave energy sectors of humid tropical coasts where a sand supply is available to be built into ridges by wave action, but where wind action is too weak for dunes to be formed, except to a very limited and local extent.





### **NORTH QUEENSLAND NATURALISTS**

| R | efe | rer | ices. |
|---|-----|-----|-------|
|   |     |     |       |

| Bird, E. C. F. | 1970 | Coastal evolution in the Cairns district, Australian Geographe vol. 11, pages 327–335. |
|----------------|------|--|
| Hopley, D.     | 1970 | The Geomorphology of the Burdekin delta, Monograph No. 1 James Cook University.        |

Beach ridges on the east coast of Malaya, Journal of Tropical Nossin, J. J. 1964 Geography, vol. 18, pages 111-117.

Beach-ridge development in Tabasco, Mexico, Annals of Asso Psuty, N. P. 1965 iation American Geographers, Vol. 55, pages 112-124.

CLUB OFFICERS — SEPT. 30, 1972 to Sept. 1973.

President: A. J. CASSELS, Esq.

Hon. Secretary: Mrs. M. L. CASSELS. Hon. Treasurer: Mr. W. HUDDY.

Editor: Miss J. MORRIS.

Patron: Mr. S. E. STEPHENS.

NOTE: Inevitably, regretfully, it has been decided that our subscription rates must be increased, as shown on Page 1.





## THE

# NORTH QUEENSLAND

# NATURALIST

CAIRNS

Journal of



## NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS-The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

> ADDRESS - Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS-Second Tuesday of each month at Oddfellows Hall, Lake Street, p.m.

FIELD DAYS-Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30) :

City and Suburban Members, \$3.50

Country Members, \$3.00

Junior Members, \$1.00

Club Officers -

President:

W. Huddy, Esq.

Hon. Secretary: Mrs. M. L. Cassels

Hon. Treasurer: Mrs. H. Turner

Editor:

Miss J. Morris

Patron:

Mr. S. E. Stephens

Vol. 40

November, 1972

No. 159

## CONTENTS

| Note to Exchange Clubs and Societies   | Page<br>Page | 2  |
|--|--------------|----|
| Natural Ecosystems in the Iron Range Area of Far North  Queensland by Gail Davies, Trinity Bay High School |              |    |
| Recollections from the Peninsula  The Late * Stanley H. Boyd, Cooktown                                     | Page         | 8  |
| "Each Author is responsible for the opinions and facts exp<br>his or her article."                         | ressed       | ir |

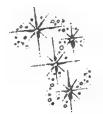
### NOTE TO EXCHANGE CLUBS AND SOCIETIES:

Walking along Cairns foreshore recently, a member made conversation with a woman studying the birds, only to learn that she was here on a study grant from England and was leaving the next day. Had she known of our club previously, we could have helped with advice on bird localities. Any member of your society, when in Cairns area, is welcome to contact our club secretary for information on any nature section.

\* \* \* \* \* \*

Cairns tidal flats at the moment are host to literally thousands of migratory birds. How long will this last? Plans call for these flats to be buried in the cause of "Progress".

-000-



### NOTE TO ALL READERS:



Season's Greetings!

butions for the Journal.

X.

And please send some more contributions for the Journal.

-000-

# NATURAL ECOSYSTEMS IN THE IRON RANGE AREA OF FAR NORTH QUEENSLAND

by Gail Davies, Trinity Bay High School

Adapted from a paper presented to the Youth Ecological Seminar of the Cairns Branch of the Wildlife Preservation Society of Queensland, 4. 3. 72

### THE MARINE ECOSYSTEM:

The Weymouth-Lloyd Bay areas are very subject to strong tides. This can be seen from the changes to the silting at the mouth of the Claudie River during a relatively short time. About thirty years ago the foreshore was well over half a mile from its present position and many of the huge granite boulders now in the sea were used as caves and shelter by the Aboriginals.

One such cave, under a spectacular balancing boulder, may never be entered again. We were told that in front of it there is now a stinging seaweed, from contact with which two people have died and another two were recently badly hurt. There were no weals or any marks, but the poison affected the nervous system causing extreme pain, cramps, unconsciousness and death. Many will doubt the existence of such a plant but the Aboriginals vouch for it.

This was the first summer that stinging jellyfish were seen in the seas off Iron Range. We were assured there were none so we swam frequently in the clear warm water, which to me seemed saltier than the sea near Cairns.

The primitive mammal, the Dugong, is plentiful in this area. The warm waters promote vigorous growths of sea-grasses on which the Dugong feed. The most conspicuous seaweed is the thin but wide, slimy-leaved reddish form, found in thick deposits on the shores of Lloyd Bay. At high tide many creatures, for example the crinoid Featherstars, sea squirts, sea urchins and the brilliant pink and yellow sea cucumbers are washed up. When the tide recedes they are virtually unaffected by the sun, wind or seagulls, being protected in a damp spongy mass of rotting kelp.

The area is sheltered by many reefs, shoals and small islands. The reef proper is several miles out at this point. Innumerable trochus shells can be found along the beaches, also Nautilus shells, cowries and bailers. We found an ancient log that must have been in the sea for months as when we picked it up, it nearly dissolved through the ravages of Teredinidae, the wood boring molluscs; only the barnacles held it together. Hundreds of different sized cuttlefish shells were washed up every day, as they were near Cairns ten years ago, though the numbers here seem to have dwindled. The natives have a remedy for asthma of which the chief ingredient is cuttlefish shell.

Large turtles, live in the reef waters, the most common having a deep green shell patterned with brown and black. Their shells are prized by the Europeans, their flesh by the Aboriginals and their eggs by the pigs. With all these factors against the glorious creatures, inevitably their numbers are falling. There is a current hypothesis that the turtles eat the jellyfish and the increasing frequency of jellyfish could be caused by the turtle extermination.

The whole coastline between Portland Roads and the Old Mission Site is well known for sharks, one of which I nearly trod on whilst swimming at Restoration Bay. It was very well camouflaged and I was not wearing glasses at the time. The fishing at the picturesque old mission site was said to be unequalled - so we managed, on the third day, to spear a sting-ray, which was delicious! Arond Big Lloyd Island and its two companions are many tuna and trevally, sought after by the Japanese.

These island were once parts of the mainland, They have only sparse vegetation on their slopes, owing to the annual fires, but at their rocky edgesgrow thick borders of mangroves that shelter Torres Strait pigeons, lizards and carpet snakes.

### THE MAINLAND ECOSYSTEMS:

The mainland flora is divided into four main regions. These areas are from the shore: the inter-tidal mangroves and those growing above tide level: the claypan melaleuca country; the eucalypt forest; and finally the unique rainforest on the ranges.

The Shore Mangroves: Of some sixteen varieties of mangroves in this region I could positively identify one, the Rhizophora, present as a clump of four plants near the new barge site - these may now have gone owing to intensive blasting in the area. (Note 1): The only other mangroves actually growing in the water are at the Port at Weymouth Bay wher they form a dense mass, several hundred yards deep along the bay's perimeter, interspersed with creek outlets. These mangroves are home to a species of honeyeater found only in this Claudie River area. There are tiny blue butterflies that lay their eggs on mistletoe only in this type of mangrove. There are also plagues of mosquitoes.

In the Lloyd Bay region the mangroves mainly grow high up on the sand dunes well out of reach of the sea. The only parts of these plants I could see were the orange-red discarded leaves, about 4.5cm long and stiff.

At Restoration Bay there is not a mangrove belt; instead large palms grow down to the water's edge and a dense belt of bushes recedes into the distant hills. The sand at the old mission site is rich in rutile, which has been mined in the past and the beach has not been reclaimed. We were able to pick up handfuls of the heavy black sand.

Creek Bank Mangroves - Claypan Melaleuca Country: For severally miles up the three major rivers and their tributaries are belts of mangrove plants and intertidal bullrushes and grasses. At the first accessible crossing one mile up from the Claudie mouth, the soil is a cloggy clay, excellent for retaining water between tides. On the low bank grow stunted ti-trees, some of which contain Antplant in their moist forks. The ground was littered with small granite boulders supporting lichens and having delicate grasses seeding in the cracks. A red seeded sedge grew abundantly in the marshier areas which were alive with mosquitoes. The trees swarmed with green ants; on one small gumtree were eleven nests. At this crossing the bank was very low but sheared off and eroded. Only a few scrappy mangrove trees grew on the community side, but opposite was an impenetrable wall of differing greens.

At the second crossing a mile further up stream the bank on the community side was a steep fifteen feet high. Main vegetation on the dull red, fairly loose soil was stringy bark and paper bark eucalypts and an occasional pandanus. In the murky river we saw the shadowy outlines of two large stingrays. The opposite bank was low and covered with mangroves. Near this crossing, in a damp dark bend of the river in very rainforesty conditions, we found one of the most unusual plants ever. Imagine a bucket full of sawfish swords, each about fifteen to eighteen feet high and falling as do ordinary leaves. It had a large green fruit similar to a pineapple and weighing three to four pounds - the driest thing I have ever tasted. We guessed that this was some form of Pandanus.

To the south, at the end of Lloyd Bay, is claypan country, a flattish, well drained and, in part, well eroded area of thick barren clay that is extremely treacherous after even a few points of rain. Here grow a mixture of Melaleucas, some mangroves, stands of pandanus and black boy and sparse grasses. Large termite nests, some like examples of contemporary sculpture, also scrub turkey and bush hen mounds can be seen along the track to the old site. This country continues up to three miles inland, until the better soils of the ranges are encountered. Near the banks of the larger creeks the cover improves and here the vine (Abrus Precatorius) producing the highly toxic giddygiddy beads need be eaten to result in a very unpleasant death.

The Eucalypt Forest: Around the community there is little or no evidence of the white clay country. Instead the mangroves give way directly to an open sclerophyll forest dominated by Stringy Bark, Box and Bloodwood, all growing to about twenty feet before branching. The Aboriginals use the bloodwood sap as a remedy for toothache. Soils in this region vary. At our tent area the soil was a white sand over a very humus-enriched black sand. The present community site was cleared on poor dry stoney soil, on a slope, about three miles inland by the track. All efforts to replace the natural growth with poinciannas and other plants that thrive in Cairns and even at the old site have failed. So the first thing the visitor notices is the stark bare oval amongst the deeper, duller forest colours.

In the areas of better soil in the forest grow stands of the locally called Ashgum, a semi-papuan species, Tessellaris or affinity Papuana, with tall yellow-green trunks emerging from the rough grey boles.

Further inland the country begins to undulate, the cover becomes thicker and the Ashgum more prevalent. During the second world war this area was commandeered by the U.S. Airforce, and three adjoining airstrips were built. After twenty-five years all that remains are some scattered pieces of bitumen amongst the gums; the only perceptible difference is that the trees are younger and slightly smaller than their companions.

The natural ground cover of young gums, decaying logs and mulch is burnt off before the wet each year by the graziers to get a good grass crop for their cattle in the next season. As a result, young plants are being killed off and there are few replacements for the older trees. The wiry, undesirable grasses are taking over and erosion is evident already.

Two species of green snakes occur in this forest, only one of them a potential danger. Small fast lizards frequent the bush, and large frilled necked lizards can often be seen running from the tracks as vehicles approach. Also in this forest I saw a grey owl just after dusk one night, and we all saw a small hopping marsupial by the road side.

The Rainforest; The most accessible rainforest in the district is really a primary stage in damp gullies, reasonably protected from fire. Here larger trees grow, bound by large, tough vines - Waitawhile country. Out past the airport a lot of this country is being cleared and it has been found that copious quantities of superphosphate are required to produce crops and legumes. Some other portions of this land have been constantly grazed by cattle and are now, in some parts, agriculturally barren areas, no longer capable of supporting cattle.

The remnants of the original rainforest are virtually impenetrable, hence their survival. The Janet Ranges and the Tozer Mountains are the genuine rainforest outposts formed when Australia and New Guinea were joined for three different and relatively short periods of time. The area is unique, incorporating both New Guinea and Indonesian species of trees, insects, birds and marsupials with Australian varieties. This fauna ceases south of Coen as nautral barriers prevent most of these creatures from dispersing further into Queensland.

It is not easy to guesss just how much untouched forest exists as the area is fairly inaccessible and few people care to explore the ranges, where the stinging trees grow to thirty feet high, and there is lawyercane and waitawhile. To see such places makes one admire the tenacity of men like Kennedy who passed through this area.

The Aboriginals say it is easy to live in the rainforest as many of the plants have edible fruits. We saw one fruit that was like a medium sized orange tomato with a semi-embedded hairy seed at the bottom. Native creatures in the forest include the naked-tailed Cuscus and a virtually unknown species of bandicoot that has almost invisible ears and a kangaroo type gait. Rare black parrots, once thought to be totally extinct, exist precariously in the humid forest depths, and other rare birds occasionally seen include the red-cheeked lorikeet, palm cockatoo and the gold-shouldered parrot.

Captain Cook first introduced pigs to this continent and since the advent of the missions, pig numbers have grown alarmingly. These mammals eat roots, insects, small marsupials, just about anything they can find. Their presence is one threat to the rainforest.

In the rainforest towards Portland Roads, mining leases are current as the area is rich in gold, copper and iron ores.

Early in our stay the presence of more deadly rainforest inhabitants came to us when a prospector was rushed to the hospital suffering the bite of a Taipan snake. This man is one of the few surviving victims of a Taipan's bite. Also seen were common green snakes and a King Brown.

Some of Australia's most beautiful butterflies and beetles are found here. One is a large jet-black birdwing, (Ornithoptera) which has slender, bright emerald markings on the upper wing side with a deep blue elusive stripe running from the centre top to the midwing, and a furry yellow body. Many peacock coloured butterflies can be seen among the dull green foliage. Also common are the Diggles Blue, the Oak Blues and Greenbanded Blues, Northern Jezabels and rare Orange Jezabels. Christmas beetles - family Scarabacidae - are often seen, the most splendid being the regally coloured gold Anoplognathus Parvus and its relatives. Cicadas compete with multitudes of forest birds in song, ranging from small distinctly marked brown cicadas to the huge three inch long drummers. (Ref. 1).

### MY CONCLUSIONS ABOUT THE IRON RANGE AREA.

"Earth is our heritage and I promise to try to keep it beautiful, by learning to understand it and conserve its soils, air, water, natural beauty and ALL its living things". Those are the words of the Gould League Pledge and they apply more than anywhere else in this much abused continent, to the natural environment in the Iron Range area. The pledge is all very well, but how can we understand when we do not know just what, or how many living things exist in an area?

The lack of understanding began with Captain Cook and his pigs, and has been perpetuated ever since.

The Aboriginals know the area, its good and bad points, its resources and how to use them. Some of their ancient remedies are now being found to be extremely effective and some have been adapted to Western medical practices. The natives never senselessly slaughtered anything; they existed in harmony with their environment, being part of it. We have a lot to learn from our Aboriginals.

When the Europeans came, they burnt and cleared square miles of land for their safe, sterile homes and their stock. They slaughtered crocodiles for their skins, to make shoes and handbags; the defenceless turtles for their flesh and shells; the dugong for their supposedly medicinal oils - all for money. Pigeons were shot for sport, meat or feathers.

This wanton destruction caused, in a few years, the end of over twenty thousand years of determined trial and error by Nature.

It seems that little thought for the future, or even the present, is put into any project proposed for the development of our far north. The new barge landing at Quintell Beach is a typical example of blundering myopia. Huge boulders have been blasted to fragments and used as fill for the soil and concrete ramp. Truck loads of black sand, taken from the eucalypt forest, are dumped on the ramp. For every two loads

dumped, one is washed away by the sea to return and further pollute the once white, coralline sands. (Note 2): The former wonderland of organisms in the thick kelp beds now rot and stink through suffocation. Owing to its foolishly selected site, the landing may never be economically used.

The proposed Weymouth development plan is outrageous. In cross-section, the country resembles stylized waves, with anticlines on synolines, steep slopes and inaccessible ridges. "Exoctic timbers are just asking to be taken" - if they can be reached. "The land is perfect for crops and cattle" - if it is liberally doused in superphosphates and held together, in the wet season, by concrete fortifications.

There is a great lack of geographical, archeological, anthropological, botanical and zoological knowledge of the area. It is known that certain birds and insects live only in these localities; investigations are bound to reveal more of them.

The recent entomological expedition by the Australian Museum, Sydney collected some 600 unknown and unnamed insects in the Claudie River rain forests. Amongst the entirely new genera and species found were members of the family Platystomatidae – tiny stalk-eyed flies; and wasps, some being up to three inches long. Many new varieties of fruitfly and firefly, bagpipe cicadas, lacewings and beetles were caught by night hunting with powerful lamps. Insects have a pre-imposed size limit, owing to their method of respiration; some of the Iron Range insects go close to being the largest in the world.

I strongly urge that before more annual fires, or futher mutilation of the rainforests, qualified teams go to the area and unveil its unique secrets. We could not even guess what was there.

"A person should not shoot the bird resting on his head", say the Bantus. This area rests heavily on our heads. Ignorance is no excuse for us to desecrate it.

POSTSCRIPT: In early June I had the good luck to pay a return visit of one long weekend to Iron Range.

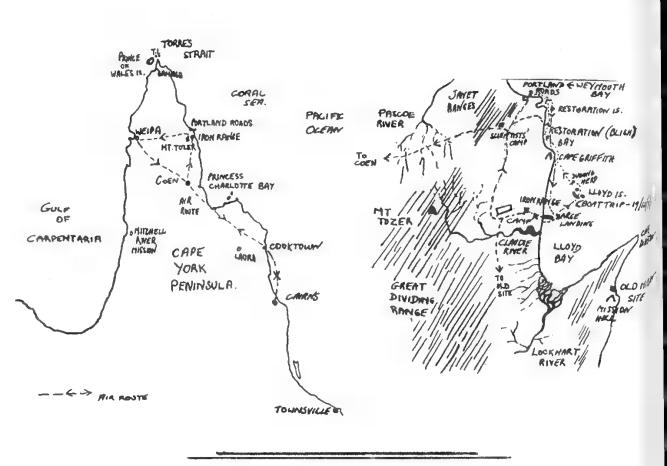
After several months of heavy rains the many gullies were filled with cold. fast-running water. Erosion was everywhere, and the "Main Road" from the airport to the community had been re-routed three times in places.

Most of the trees were water-logged. The glorious Ashgums were a dull green, yet everything looked relatively fresh and green. Few examples of wild life could be seen, though I was told the wallabies were in millions in the forest.

On the shorelines, salmon fishing by the Aboriginals was in full swing at low and high tides, when spectacularly sized fish were speared. The cod caught in recent months were averaging around 60lbs. Dugony fishing was poor, but turtles were frequently caught. I tasted my first turtle, cooked native style, and it was most appealing.

Notes 1 & 2: The barge landing is finished, the area much disturbed, but the mangroves are still standing. The ramp is now a concrete covered structure but shows signs of cracking as its supporting sand settles with the water flowing through it. The approach to the ramp is rocky and very shallow - even for barges. It may never be used.

Reference 1. - Entomological Society of Queensland "News Bulletin" No. 85, April 1972.



## RECOLLECTIONS FROM THE . PENINSULA

The Peninsula country north west of Coen has usually been dry for months before November thunderstorms come. Then the small gilgais and "melon holes" are filled, only to dry up again in the summer heat. Many years ago, I remember a party of stockmen found a 3 inch perch in a gilgai which had filled in an overnight storm. The nearest permanent water was a lagoon three miles away. Another year, after a November storm in the open melon-hole country, a native stockman with me found a baby turtle (tortoise) about the size of a man's thumb-nail, in the bottom of a three-foot-deep melon-hole. All the water had dried up, so I took it back to camp in my pocket. There we set it down on the pad to the lagoon, but facing out towards the plain. Released, it turned and headed straight towards the water, and all of us went with it to save it from birds and to marvel at its unerring sense of direction.

### The late "Stanley H. Boyd, Cooktown.

The Cunning Crow A water hold with water like milky tea soon became like pea soup when a few cattle walked through it. Then all the small fish commenced poking their heads up gasping for air, and then the crows got to work. They could grab a fish, take it out on the flat among the shade trees where the cattle camped each day, drop it on the ground amongst the hundreds of heaps of dry cow dung, and pull a lump of the dry dung on top of the fish. Later we saw a crow uncover a fish and take it away.

## THE

# NORTH QUEENSLAND

# NATURALIST

CAIRNS

Journal of

## NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions.

City and Suburban Members, \$3.50

Country Members, \$3.00

Pensione and Junior Members, \$1.00

Vol. 40

March, 1973

No. 160.

# THE TIDAL FLATS OF THE CAIRNS ESPLANADE WITH REFERENCE TO OTHER MARINE ECOSYSTEMS By David Jones, Trinity Bay High School

(From a paper presented to the Youth Ecological Seminar of the Cairns Branch of the Wildlife Preservation Society of Queensland, 4.3.72)

### Introduction:

The muddy shores of our estuaries might seem to be exceedingly undesirable places for animal (particularly Homo sapiens) and plant life, but at certain points a passing glance would quickly correct this opinion. I set out to investigate, if I could, the following points:

- That the productivity of the region could equal or even exceed that of the most fertile land in the world:
- That the mangrove-tidal-mud environment provides a vital link in the great marine food-chains of the Cairns region:
- 3. That the preservation of the above areas is justified in all but the most minor aspects

Between 11 December 1971 and 6 February 1972, the collection of data following the report required approximately 40 hours of field work and a further 30 hours spent in the analysis of the information obtained. I believe that the evidence which I collected during the various phases of my field work fully supports the hypothesh which first motivated me to do such a piece of pure research. In my report I shall discuss the geographical factors which affect this area; the special stability of this type of environment; the animals which dwell in the tidal mud; and most importantly, the relationship of the tidal-mud-mangrove area to the marine ecosystems and the economy of the Cairns area.

### TOPOLOGY OF THE SPECIFIC AREA UNDER STUDY:

The majority of estuarine muds on the Cairns Esplanade are extremely viscol and this poses a serious problem of access. I set out to walk the entire length of the foreshore to find which area would combine both ease of access and diversity of life forms. From this preliminary survey I also gained much information on how man s activities affect the tidal mud environment. Opposite the Cairns Base Hospillal the surface was like a liquid to walk on, and the mud remained viscous until I reached the northern end of the fore-shore where the mangrove forest begins. Here a shallow layer of sand projected to about 400 feet from the shore. This was the best area for my study.

Basically, the region which I studied is one of marked contrasts. Looking along the sandy beach, one immediately notices the goat's-foot vine (Ipomoea pes-caprea), so characteristic of the transition between terrestrial sand and semimarine environment. This belt is approximately 20 feet wide and is dotted here and there with grouped tussocks of couch-grass. As one moves from the area of maxim growth the abundance of the vine dwindles so quickly that a sharp dividing line is formed between it and the sandy beach. The area of sand extends for 38 feet with average gradient of 1 in 2. At this point the actual beach ends at a channel about 1 feet wide and 4 inches deep. The sand spit is now reached which extends out into the tidal muds. As one progresses out onto this area, which lies between the mangroves and the exposed mud community, the proportion of mud gradually increase until a transition zone is reached. The surface here is dirty brown in colour and of can walk on it with few mishaps occurring. Beyond this transition zone are the vis cous grey and brown estuarine muds. From this point onwards penetration was, for me at any rate, impossible. Basically the same pattern emerges if one walks along parallel to the shore.

A physical factor of major importance is that two storm drains empty out in my region. During my first few visits they were dry and partially blocked by sand because there had been no substantial rain for many months. However, from 6th 9th January, over 20 inches fell in Cairns. The resulting flow from the drains forget two channels at right angles to the shore and these passed directly through the sand spit. Two large pools were formed just below their outlets, in which many thousand of small fish of a variety of species seemed to be thriving. A week later the flow of fresh water from the outlets had almost ceased.

To the north of the sandy area is the mangrove forest. Seedling pioneer specific of Avicennia and Rhizophora have invaded the edge of my region and the succession of species can quite easily be seen. I found by counting that the Avicennia seedling are outnumbered by about 3 to 1, even though they are much larger and at first glance appear to be the dominant group.

One of the most important features is the extreme flatness of the estuarine mud. Apart from the beach, almost the entire region is horizontal. This means that a difference of only a few inches in the depth of the water can expose hundreds of yards of sea-front in a short period of time. The currents in the area are gentle, bally rapid enough to be observed. As the tide is receding, a flow is established toward the mangrove region; as the tide rises, the reverse occurs. This would allow for the

exchange of material between the two areas and would tend to cause a slow spreading of the surface sand layer.

THE EFFECTS OF RAINFALL, WIND SPEED AND TEMPERATURE VARIATION:

One factor which alone makes the mudflat environment unique is the extreme variation in the salt concentration which is periodically experienced. To alleviate such varying conditions, most of the inhabitants are found below the surface. The mangroves, those strange plants which live in a semi-marine environment, cannot survive without periodic inundations of fresh water. Thus rainfall is the major physical factor which influences the tidal region. I was caught in three sudden monsoonal rainstorms, so characteristic of December and January in North Queensland, and know this to be true.

As the storm clouds approach and the wind speedincreases, a sudden lull occurs in the activities on the mud-flat. All species of crabs retreat into their burrows, the sea-birds fly away to shelter, and the area becomes strangely quiet. One no longer hears the cracking of the pistol prawns and the popping of the mud as another crab emerges from its burrow. During the period of rainfall the tidal mud region is quickly drenched by an inch or so of fresh water. This is due to its extreme flatness and lack of vegetation. If enough falls then the storm drains will begin to flow, thus adding their quota. After the storm is over life quickly returns to normal, but this is not the case if rain falls for several weeks. At these times tremendous volumes of water come from the mouths of the Barron and Trinity inlets, thus resulting in the formation of virtually a fresh water lake over the estuarine muds (i.e. at high tide.) Unfortunately, I was not able to observe the effects of such prolonged exposure to water of low ion concentration because I had a time limit on my survey Such a study would be very interesting.

I was able to observe the effects of 3 days of continued rain, in which 20 ins fell. I was surprised to find that this period of rainfall did little to affect the numbers of organisms which lived below the surface. However, one species (Telescopium telescopium) which lives on the surface was notably distressed. Many of them were lying point downwards in the sand and some were partly buried. It was obvious that if the rain had continued then the numbers of this and other species could have been seriously depleted. Therefore I believe that there is a cycle in the abundance of the organisms which is controlled by the amount of rainfall received. In the late summer months the number would be at its lowest due to the almost continuous inundation. The numbers would again build up in autumn and winter but would reach a peak in the spring and early summer months. It was during the peak that I believe I carried out my survey.

Our tropical environment can also be linked to the winds which blow over the Cairns region. Low pressure systems and cyclones are prevalent during the summer months and so influence the wind speed and direction. During the morning the winds usually blow from the S.E. but towards evening the temperature is reduced by the cool north easterly sea breezes. The S.E. winds have very little effect on the exposed tidal muds.

Even though the evaporation rate must be tremendous, a thin film of surface water is being continually replaced from below. Therefore dehydration is not a major physical factor influencing the inhabitants of the estuaries. The same applies with temperature variation, even though on hot sunny days only crabs and certain univalves are found on the surface. The water can become reasonably warm but this does not seem to affect the myriads of fish fry and plankton which live in it. So we see that in many ways this environment favours the settling and development of life forms much more than on the rock faces of the sea-shore or the mountains and dry plains of terrestrial earth.

METHODS USED FOR THE COLLECTION OF DATA.

The inhabitants of the mudflats are extremely shy and even the slightest movement near their burrows causes them to disappear immediately. As one is

approaching the area under study thousands of crabs of different species will be seen busily foraging for food or trying to catch the attention of a female. However as soon as one disturbs the ground they quickly retreat into their holes, often 3 or more together in their haste. This makes direct observations of the behavioural patterns and foraging techniques of the denizens of the tidal muds extremely time consuming and somewhat hard on the back! By far the best technique is to kneel down on the surface of the area in which one knows there is a large population of macroscopic species and try to remain perfectly motionless.

At first one will see nothing but suddenly a single crab will come to the surface of its burrow to cautiously look around. Finally it will emerge and suddenly one is surrounded by dozens of crabs of a number of species. It is as though the emergence of one individual acts as a signal to all the others. Sea birds will also come quite close if one uses this technique. I found that after about half an hour of repeating the same action, e.g. walking to and fro while digging a quadrat, the fiddler crabs in particular become used to one's actions and will continue their activities nearby. If, however, one comes too close to where some have been foraging while another is being examined then they will retreat immediately. The conditioning seems to be short-lived because on the next day the crabs still require the same time to become accustomed to one's activities.

I found that quadrats provide far more information than transects about the numbers of species inhabiting the mudflats and why certain species are found in certain locations. However transects are vital to obtain an accurate map of the topography of the area and which surface species inhabit which zone of land. I stress surface activity because most of the species and activities of the estuarine tidal flats are found below the surface. In my survey I used quadrats of 9 cubic feet in volume (3ft. x 3ft. x 1ft.), combined with small random samples and transects of varying lengths. This method allowed me to compare the data from different locations in the section of the Cairns Esplanade under study.

For preserving most specimens, a solution of formalin in seawater (1 in 20) was effective. Creatures with a limey exterior were best preserved in a solution of 75 parts methylated spirits to 25 parts tap-water. Formalin solution can be used to preserve mangrove seeds, but is not successful for actual plants as the green pigments diffuse out, leaving a brown, dead-looking mass. To estimate the proportions of different soil components in each quadrat, samples were placed in uniform containers with water, shaken well and allowed to settle; then the thickness of each layer of sediment was measured.

As mentioned before, the flatness of the region largely determines the amount of exposure suffered by the soil. Most of the organisms come to the surface just as the tide is receding and enjoy a brief period of activity, before retreating again due to the increase in light and heat intensity. Therefore the best method for the collection of many speices of fauna is to follow the out-going tide. One or two hours before low tide, when the water is about 7 inches deep on the flats, an examination can be made of the sandy beach. Then, as the tide allows, one can follow it out. However, once it reaches a certain point, almost the entire flat is exposed in about 25 minutes. In contrast, the best time for examining the sloping rock-face on the sea-shore is at the lowest of low tides. Temperate, overcast days are best for collecting purposes.

### DATA FROM THE QUADRAT AND TRANSECTS

To gain an accurate picture of the mudflat region one must investigate the variation in physical factors with depth and locality, and their relationship to the numbers and types of organisms found there. From three quadrats and three transects I tested samples for the variation in chloride and sulphate concentrations and pH in depth, and analysed for the percentages of various soil components particularly the amount of organic matter.

Several interesting and important regularities emerged. Firstly, the variation

in stratigraphy was almost the same in every quadrat and transect studied, the only variable being the thickness and depth at which each layer occurred. The layers appeared in order, beginning at the surface:

- 1. A layer of fine, medium and coarse grained sand;
- 2. Fine grained sand and grey mud;
- 3. Black mud with much organic matter;
- 4. Viscous grey mud with fine sand;
- 5. A solid layer of fine sand with mud or the compressed shells of dead animals.

The black mud layer is the most productive of all for it constitutes the region of decay. 95% of it.consists of organic matter which is of mangrove origin. Here we see one of the most important links between the mangrove forest and the tidal muds; the basic food materials of the Cairns Esplanade originate in the mangrove mud. This is also the reason for the tremendous number of crabs because they can utilise directly organic matter in this form. In this layer of decay, the greatest activity on the mudflat is found. It is literally teeming with zooplankton, protozoans and diatoms in an amazing variety of form and structure. The ciliates and flagellates are by far the most common representatives of the protozoa. Shrimp, crab, bristleworm and amphipod larvae and copepods make up the astronomical numbers of the zooplankton.

Secondly, a relationship was found which linked the pH of the soil and the chloride and sulphate concentrations to the number of life forms existing at different levels. Peaks occurred in both of the ion concentrations in the decay layer and this correlated with an acid pH and, most importantly, a peak in the amount of organic matter and the number of life forms.

A feature which must surely impress anyone who visits the tidal region is the increase in the numbers and diversity of organisms as one progresses from sandy beach onto the tidal and mangrove muds. The sand, where only amphipods, soldier crabs and bristleworms are to be found, is virtually a desert when compared with the other regions. The muds of the mangrove forests, which are bound together by tens of thousands of miles of the fine roots of Avicennia and Rhizophora, are inhabited by thousands of crabs and billions of planktonic organisms. A similar situation is found on the exposed tidal flats, but here there is no interlacing network of mangrove root systems. It is here that the growth and development of planktonic organisms occur, and it is here that the crabs reach their greatest abundance and diversity. From my quadrats and transects I was able to determine the distribution of crabs, plankton, mangrove species, and bristle worms, with regard to soil composition.

Clearly the tidal muds of the estuaries are really vast biological decay areas, where the pieces of organic matter are broken down into their components so that once again another cycle of life and death may begin.

### COMMENT ON THE ACCOMPANYING SPECIES LIST'

There are two outstanding conditions that make life on the shore flats of estuaries different from that on the ocean and coral cay beaches. Firstly, the water is, as already noted, usually still. Even a strong wind scarcely raises small waves to disturb the stillness of the shallow sea bottom, and the quiet current distributes a rich store of rotting debris from the mangrove woodlands, covering all surfaces with a deposit of organic matter. It is this special stability of the tidal flats which makes them unique. Captain Yeasely of the dredge "Trinity Bay" showed me a chart of the Cairns Esplanade compiled in 1905; not one major topographical feature had changed in over 60 years. The muddy shores thus have great riches in the way of food. Secondly, the sea-water is at all times, likely to be subject to great changes in salinity and may always be less saline than on the ocean shores, since there will always be some rain water draining down from the land. At times this amount of fresh-water is great, as previously described.

Whilst these conditions may provide a barrier to the inward migration of most

of the sea creatures of the nearby ocean beaches, they have resulted in the evolution of species specially adapted to the mudflat environment. And since, as indicated, the estuarine muds are very rich in organic matter, the individuals of those few adapted species are often exceedingly numerous. When comparing the number of species that I found and identified with those in a survey of Michaelmas Cay one can see that the mudflats are unique in that the comparatively few macroscopic species exist in tremendous numbers, whereas a coral cay is unique in the diversity of its flora and fauna.

### — LIST OF SPECIES IDENTIFIED ——

### CRABS:

Uca marionis var: vomeris (Fiddler crab)

Macropthalmus carinimonus.

Sesarma erythrodactyla.

Scopimera inflata (Sand-bubbler crab)

Paragrapsus laevis.

Mitrys longicarpus (Soldier crab)

Scylla serrata (Mud crab)

Ocypode cordinara, (Ghost crab)

Ocypode ceratophthalma.

Diogenes custos. Hermit crab)

### PRAWNS:

Squilla laevis (Mantis Shrimp or Prawn Killer) Alpheus audouini (Snapping Prawn)

### BRISTLE WORMS:

Perinereis nuntia.

Glycera .....

Australonereis chleria.

Aphroditidae (Family only)

Four unidentified species.

### WORMS:

Bright orange-red ribbon worm (Class Nemertae)

Peanut worm (Class Sipunculoidae)

Shipworm (Genus Teredo)

Phascolosoma noduliferum.

### SAND HOPPERS AND SEA LICE:

Ligia australiensis (Sea Slater Order Isopoda)

Talochaetia novae-hollandiae ( A Sand Hopper Order Amphipoda)

### **UNIVALVES:**

Pyrazus ebeninus (Hercules club shell)

Telescopium telescopium ("Cone" shaped shell)

Melarapha scabra (Periwinkle)

Bullina lineata (Bubble shell)

### SEA SLUGS:

Onchidium danelii (Order pulmonata)

### **BIVALVES**

Eunarcia fumigata.

#### BIRDS

Larus novae-hollandiae (Silver Sea gull)
Ardea sumatrana (Great-billed Heron)
Notophayx novae-hollandiae (White Faced Heron)
Sterna bergii (Crested Heron)
Erclia testacea (Curlew Sandpiper)

### FISH:

Ostreogobius australis (Brown Speckled Goby) Arenigobius semifrenatus (Bridled Goby)

### PLANKTON:

Phronimella elongata (Planktonic Amphipod)
As well as the above there were shrimp, prawn, crab and bristle worm larvae.

### PLANTS:

Zostera (Eel Grass)
Avicennia marina (Mangrove)
Rhizophora stylosa (Mangrove)
Ipomoea pes-caprea (Goat's Foot Vine)
Sonneratia alba (Mangrove)
A type of hardy couch grass.
Unidentified Algae.

Copepods (Order Copepods)

# WHAT WOULD HAPPEN TO THE CAIRNS TIDAL FLATS IF LEFT IN THEIR NATURAL CONDITION:

Where Mudbanks of river silt are formed in sheltered areas along the shore and are exposed at low tide, seeds of pioneer mangroves find a root-hold. When fully developed, the intricate maze of their roots and pneumatophores slows down the tide movements and traps floating debris and silt which gradually builds up the level of the forest floor. Conditions become suitable for the non-pioneer species to establish and form a mangrove forest. Finally an extension of the shore itself is created, which is submerged only at the highest high tides. Conditions are now suitable for grasses to begin to grow and the mangrove forest is slowly replaced by species of Acacia. Thus a slow process of succession results in the natural reclamation of the tidal mud area.

This process has been halted on the Cairns Esplanade by the regular removal of young mangroves as they become established. However, in my area at the northern end, there is a wide band of mangrove forest. It shows a marked transition of zones from its outer edges, as can be seen in the height, age and population density of the various mangrove species.

### THE EFFECT OF MAN ON THIS ENVIRONMENT:

From my preliminary survey when I walked the length of the Esplanade I was able to gauge the amount of visual pollution of that part of the mud flats nearest the shore. I found that the maximum pollution occurred near the centre of the city where the park benches look out over Trinity Bay. On the sandy shore and in the mud directly in front of the benches the number of intact and fragmented beer bottles was astounding. Aluminium and steel beer and soft drink cans were also abundant, as were other residues, particularly newspaper, polythene bags and the inner tubes of car tyres. Progressing north to the suburban area I found the amount of glass and cans quickly fell off However the amount of paper and plastic, rotting sugar bags and tyres remained constant. As expected, the number of discarded soft

drink cans reached a small peak in front of the Base Hospital. A new feature in the suburban area was the amount of garden and kitchen refuse deposited by the house owners opposite the foreshore.

I do not believe that a moderate amount of such visual pollution will have any effect on the ecology of the area.

What I am greatly concerned about is the kind and concentration of pollutant which comes from the wharves, the bulk sugar terminal, and particularly waste fertiliser and insecticides running off from Trinity Inlet and the Cairns fertiliser works. Unfortunately I could not make any measurements of these.

Of far greater importance to the environment of the Cairns mud flats is the proposed reclamation of a large area of the fore-shore for commercial and tourism interests.

### CONCLUSIONS:

Immeasurable damage is being done to the life support systems of our planet by the "quick dollar" development of rainforest, mangrove woodland and tidal flats.

I believe that the mangrove woodlands and tidal muds and the life forms of the Great Barrier Reef form a great interdependent ecosystem in which the removal of one link could result in the collapse of the others. The waters of the Reef are notorious for their under-productivity, so the plankton which supports the great food chains must be coming from regions close to the shore. My detailed study of the tidal region found in every sample teeming multitudes of protozoans and planktonic organisms, most of which were immature stages in their life-cycle - the fry of fish and the larvae of shrimps, amphipods, crabs and many others. This region of few extremes provides a stable environment in which the young can develop.

The mangrove forest supplies the basic organic material necessary for the development of the diatoms, which provide food for the copepods, which fall victim to the young shrimps, which are in turn devoured by the fry of fish. At high tide the large predatory species such as sardine move in. These in turn attract even larger species, which fall victim to the enthusiastic Esplanade angler. Crabs, too, are taken by those brave enough to venture out onto the tidal muds.

The great cycle of eat or be eaten does not end here. Currents sweeping out from Trinity Inlet wash over the tidal flats and carry the plankton and young fish out to sea, where the coral polyps in their millions feed on the tiny organisms and the larger species of reef fish devour the young of others. One might ask why the reef around Green Island became established in that position. Coral polyps not only require comparatively shallow water to settle and develop, but also an abundant food supply consisting mainly of zooplankton. Michaelmas Cay also is on the receiving end of an abundant food supply from the Cairns region. For the coral cay to support such a large bird population, the number of fish in the surrounding waters must be exceedingly great. Mangrove seeds found washed up on the shore of this cay could only "avairiginated from the coastal mangrove woodlands, so we see that a current does exist which could serve as a transport medium for the phyto- and zooplankton.

From this one can see how vital is the link between the coastal and the reef environments. Destroy the Great Barrier Reef and the tidal muds and mangrove woodlands still remain, yet rem ove these areas and one may create repercussions which are so great as to lead to the extinction of the reef as we know it today

"Each Author is responsible for the opinions and facts expressed in his or her acticle."

## THE

# NORTH QUEENSLAND



Journal of

## NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS—The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

ADDRESS — Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS—Second Tuesday of each month at Oddfellows Hall, Lake Street, 8 p.m.

FIELD DAYS—Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30) :

City and Suburban Members, \$3.50

Country Members, \$3.00

Junior Members, \$1.00

Club Officers —

President: W. Huddy, Esq.

Hon. Secretary: Hon. Treasurer:

Mrs. M. L. Cassels Mrs. H. Turner

Editor:

Miss J. Morris

Patron:

Mr. S. E. Stephens

Vol. 40

September, 1973

No. 161

## CONTENTS

### BIOLOGICAL SURVEY OF MICHAELMAS CAY

By Gwen Holmes, when a student at Trinity Bay High School.

(From a paper presented to the Youth Ecological Seminar of the Cairns Branch of the Wildlife Preservation Society of Queensland, 4.5.72)

"Each Author is responsible for the opinions and facts expressed in his or her article"

### BIOLOGICAL SURVEY OF MICHAELMAS CAY

Topography and Physical Conditions.

Michaelmas Cay is situated approximately 25 miles north-east of Cairns on the Great Barrier Reef at 16<sup>o</sup>36.5' south by 145<sup>o</sup>59' east. It is a popular tourist charter boat rendezvous, and its under-water wonderland of delicately coloured marine life attracts many visitors.

Lying in an east-west direction, Michaelmas Cay has a length of 1,200 feet

and breadth of 160 feet.

My first visit, on 19 December 1971, found the Cay a more or less oval shape with two bays, one facing the outer reef and the other facing Cairns. At low tide, sand flats exposed at both ends with a large area opening out on the Cairns side. Fairly deep water at the other side restricted exposure but further along towards the eastern end patches of live coral dried. It was only at a very low tide that reef exposed at the far eastern end.

Before my second visit, 29 January 1972, cyclone Althea had caused seas to become moderate to rough and south-east to north-east winds to blow at gale force speed. These unusually high winds and seas combined with nine feet high tides had caused dramatic changes in the shape of the Cay and the area surround-

ing it – showing how unstable coral cays are during cyclonic conditions.

On this visit, the only familiar sights were a row of three parallel rocky outcrops facing Cairns on the eastern end, a six feet high post half way up the beach, and the birds. Now the Cay had built up two horns facing in a south-east direction and curving into two bays which then formed a point in the centre. Low tide revealed other changes. Part of the original sand flats at either end had been covered by the sand forming the horns, the eastern end being the most changed. Now large expanses of live coral and reef were exposed with no sand except at the extreme edge of the Cay. Cairns side lay mostly under water except in the immediate vicinity of the rocky out-crops where there was rubbly sand merging into the live reef. Winds had caused the edges of the Cay to become quite steep and eroded, with some plants being uprooted. Approximately half the total area of Michaelmas at about half tide is covered with vegetation.

(A subsequent visit, 9 August 1972, found the shape of the Cay had again

changed considerably. See sketch maps.)

No weather reports specific to Michaelmas Cay could be obtained. The closest available were from Cairns, with the average annual rainfall being about 70 inches, the mean minimum temperature 57°F. and the mean maximum 85°F. Soil samples from various parts of the Cay revealed a pH of 5.5-6, which is the same as for the surrounding sea water. In areas where birds were nesting, organic wastes were evident. Relevant winds are mainly from the south-east to north-east directions.

An established fact concerning the development of the Great Barrier Reef is that reef building corals cannot flourish below about 30 fathoms or 180 feet, where penetrating daylight can no longer maintain plant life. The sinking of an experimental bore through Michaelmas Reef in 1928 found no semblance of basic rocks to a depth of 600 feet, only calcareous material. Two reasonable explanations are popularly accepted. One is the gradual subsidence of the shallow sea floor and the other is based on slow changes in the level of the ocean waters with which the upward growth of the coral banks has kept pace.

### Collection of Data, and Results

My first visit to the Cay was for a twelve inch tide at 4.10 a.m. on Sunday 19 December 1971. Light westerly winds were blowing and seas were smooth to

slight. On my second visit, for a nine inch tide at 3.48 a.m. on Sunday, 30 January 1972, the winds were 10-15 knots and the seas slight, with showers in the

vicinity.

Species recorded and collected from the Cay are listed below. Where possible, the scientific as well as the common name is included. I have seen or collected some 300 different species of flora and fauna during my two visits, leaving no doubt as to the great diversity of life which may be found if more time were available.

### LIST OF SPECIES RECORDED

PHYLUM ARTHROPODA.

Crabs (Class Crustacea): Hapalocarcinus marsupialis (Gall Crab) Dardanus megistos (Hermit Crab) D. deformis (Hermit Crab) Ocypode ceratophthalma (White Ghost Crab) Purple Ghost Crab Atergatus floridus (Shawl Crab) various reef species. Crayfish: Panulirus longipes (Painted Spiny Lobster) Stenopus hispidus (Banded Coral Shrimp) various reef prawn.

Insects (Class Insecta): Various species around vegetation on Cay various species

around reef.

THE WORMS.

Platyhelminthes or flatworms: Euborlasia quinquestriata (Ribbon Worm). Annelid or Ringed Worms: Spirobranchus giganteus (Coral Worm) Terebella (Sand Tube Worm) Eurythoa complanata (Salmon Bristle Worm) 1/2" long bristle worms in sand.

PHYLUM PROTOZOA

Foraminifera: Alveolina Baculogypsina Calcarina Polystomella.

PHYLUM PORIFERA

Phyllospongia foliascens (Cup Sponge) Tethya (Orange Sponge)

PHYLUM ECHINODERMATA

Starfish: Protoreaster nodosus (Rhinoceros Starfish) Linckia laevigata (Blue Starfish) Laganum depressum (Sand Dollar) Nardoa novaecaledoniae Acanthaster planci (Crown-of-Thorns Starfish) Turbinaria ornata (star in weed washed up on beach).

Sea Urchins: Heliocidaris erythrogramma (Black-spined Urchin) Tripneustes

gratilla (White-spined Urchin) Breynia australsiae (Sand Urchin) Brittle Stars: Ophionereis schayeri Ophiarachna incrassata.

Beche-de-mer or Trepang: Holothuria feucospilata (Black Cotton Spinner) H. argus Stichopus chloronotus (Dark green Spined Trepang) S. variegatus.

PHYLUM COELENTERATA

True Reef Coral (Schractinia): Acropora Humilis (Stag-Horn) A. hyacinthus Fungia actiniformis (Mushroom) F. fungites (Slipper) Platygyra lamellina (Brain) Goniopora tenuidens Porites lutea Echinopora lamellosa Goniastrea pectinata Seriatopora conferta Lobophyllia Montipora.

Soft False Corals (Alcyonaria): Tubiphora musica (Organ Pipe Coral) Xenia elongata Sarcophyton trocheliophorum Sinularia Labophytum pauciflorum.

Stinging Coral (Hydrozoa): Millepora platyphylla.

Anemones (Actiniaria): Pelythoa caesia (Colonial Anemone) Calliactis miriam

Physobranchia ramsayi.

Jelly-fish: Physalia physalis (Portuguese Man-o'-War, Blue Bottle).

PHYLUM MOLLUSCA

Bubble Shells (Fam. Bullidae): Ampulla bulla (Pacific Bubble) Hydatine physis (Rose Petal Bubble)

Helmet Sheels (Fam. Cassidae): Cassis cornuta (Giant Helmet) Casmaria ponderosa Casmaria erinacea.

Ceriths (Fam. Cerithiidae): Cerithium nodulosum (Giant Knobbed Cerith) C. cumingi C. fasciatum Rhinoclavis vertagus.

Cones (Fam. Coniidae): Conus textile (Cloth of Gold Cone) C. imperialis

(Imperial C.) C. ammiralis (Admiral C.) C. magus C. imperator (Emperor C.) C. generalis (General C.) C. flavidus C. capitanus (Captains C.) C. miles (Soldier C.) C. tessulatus C. marmoreus (Marble C.) C. aulicus (Court C.) C. sanguinolentus C. omaria (Pearl C.) C. eburneus (Ivory C.) C. virgo (Virgin C.) C. coronatus (Crowned C.) C. litteratus (Letter Marked C.) C. saturatus (Stinging C.) C. lividus (Livid C.) C. episcopus C. arenatus (Sand Grained C.) C. pulicarius C. frigidus C. distans (Distant C.) C. vexillum (Flag C.) C. nussatella C. striatus (Striated C.) C. leopardus (Leopard C.) C. quercinus C. rattus (Rat C.) C. catus (Cat C.).

Cowries (Fam. Cypraeidac): Cypraea annulus (Ringed Money, Gold Ringer Cowrie)
C. vitellus (Pacific Deer, Milk Spotted C.) C. moneta (Money C.) C. cribaria
(Sieve C.) C. arabica (Arabian C.) C. tigris (Tiger C.) C. errones (Wandering C.)
C. erosa (Eroded C.) C. isabella C. carneola (Orange-banded C.) C. caurica
C. eglantina C. staphylaea (Pustulose C.) Ovula ovum (Egg Cowrie) Calpurnus
verrucosus (Little Warty Egg Cowrie).

Band Shells (Fam. Fasciolariidae): Peristernia australiensis.

Abalones (Fam. Haliotidae): Haliotis asinina (Asses Ear) H. varia.

Mitre (Fam. Mitridae): Mitra mitra (Giant or Episcopal Mitre) M. sophaie Neocancilla papilio (Butterfly M.) Cancilla filaris Swainsonia casta (Gaste M.) S. olivaeformis (Olive shaped M.) Vexillum exasperatum V. plicarium (Plicate M.) Imbricaria conica (Common Imbricaris M.) I. punctata Pterygia conus (Cone Mitre).

Murex (Fam. Muricidae): Murex brunneus (Aolustus Murex) Transtrafer longmaniolives (Fam. Olividae): Oliva erythrostoma (Red Mouth Olive) O. episcopalis (Purple Mouth O.) O. tessellata (Tessellated O.) O. annulata (Annulated O.)

O. miniacea O. carneola.

Strombs, Spiders (Fam. Strombidae): Strombus mutabilis (Mutable Stromb) S. variabilis (Variable S.) S. lentiginosus (Freckled, Silver S.) S. aurisdianae (Diana's Ear S.) S. gibberulus (Hunch-back, Humped S.) S. luhuanus (Luhu, Red Mouth, Blood Mouth S.) S. bulla (Bubble Conch) S. erythrinus Lambis lambis (Common Spider) Terebellum terebellum.

Auger Shells (Fam. Terebridae): Terebra cerithina (Waxen Auger) T. crenulata (Crenulated A.) T. chlorata (Yellowish A.) T. affinis T. aerolata (Muscaria A.) T. dimidiata (Divided A.) T. nebulosa T. guttata (Eyed A.) T. maculata (Spotted or Marlin-spike A.) T. felina (Tiger A.) T. subulata (Subulate A.) Hastula lanceata

(Lanced A.) Hastilina casta.

Top Shells (Fam. Trochidae): Trochus maculatus Angeria delphinus. Vase Shells (Fam. Vasidae): Vasum turbinellum (Pacific, Spiky Vase). Volutes (Fam. Volutidae): Cymbiolacca wisemani (Wiseman's Volute) Aulicina rutila (Blood-red Volute) Melo amphora (Bailer) Amoria maculata (Carols Volute).

Clams (Fam. Tridacnidae): Tridacna gigas (Gant Clam) T. crocea T. noea (Fluted Giant Clam) T. maxima (Reef Clam) Hippopus hippopus (Horse-hoof Clam).

Other Bivalves: Lioconcha castrensis (Tent Marked Venus Shells) Lentillaria paytenorum Frogum unedo (Strawberry Cockle) Periglypta reticulata Promantellum parafragile (Swimming File Shell)

Scahare (Fam. Aplysiidae): Aplysia dactylomela (Spotted Hare) Triangular shaped

seahare.

Chiton (Class Amphineur): Acanthozostera Gemnata.

Nudibranches: Various species.

Octopus (Class Cephalopoda): Apricot and light blue octopus

### PHYLUM CHORDATA

Fish: Cephalophalis miniatus (Trout) Ephinephelus lanceolatus (Groper) Lutjanus sebae (Red Emperor) Lutjanus fulviflamma (Moses Perch) Lethrinus nebulosus (Spangled Emperor) L. chrysostonus (Sweet Lip) Caranx emburyi (Turrem) C. gymnostethoides (Bludger) Scomberomorus queenslandicus (Mackeral) Mugil cephalus (Sea Mullet) Caramloides letieaudis (Trevally) Lates calcerifer (Giant Perch) snapper barracuda chinaman maori wrasse various cod shark Hemiscyllium ocellotum (Epaulette Cat Shark) Dacsyllus (Humbug Fish) Synanceja trachynis (Stone Fish) various tropical fish. Reptiles: Various sea snakes, turtles.

Birds: Larus novae hollandiae (Silver, Sea Gull) Sterna hergii (Crested Tern) S. bengalensis (Lesser Crested Tern) S. anaetheta (Bridled Tern) Anous stolidus (Greater Noddy).

PHYLUM THALLOPHYTA

Seawceds: Reef-binding pink and grey-green algae blanket weed kelp Genus Lithophylum/Porolithon Hormosira banksii (Neptune's Necklace) Padina gymnospora (Brown Cup Seaweed) Phyllospora comosa (Bubble Weed) Ulva lactuca (Sea Lettuce) coralline seaweeds.

Plants: Family Zygophyllaceae (creeper forming clumps on ground, yellow flowers

prickly 5-sided seed case).

Sesuvium portulacastrum (succulent stems, waxy leaves, tiny purple flowers) Family Aizoaceae, probably Genus Mollugo (Pig-face). Two other unidentified plants and two types of grasses. Mangrove seeds and plant of Avicennia. Thalassia australis (dugong-grass)

#### Discussion

There are three main different habitats around Michaelmas: 1. Live reef and

coral rocks; 2. Coral rubble areas; 3. Sand flats.

1. The reef derives its name from the most common form of fauna - the corals. Corals belong to Phylum Coelenterata and consist of true reef or stony corals, i.e. those with calcareous skeletons, and those predominately without skeletons, the soft corals. Organ pipe coral, Tubifora musica, is a soft coral with a skeleton and is one of the two corals known whose skeleton retains its colour indefinitely. Its polyps, when expanded, completely cover the skeleton. Stony corals, e.g. brain and staghorn corals, are mainly found with the soft corals in the reef areas. Soft corals are also found in the rubbly areas.

Some shell inhabitants of the reef area, e.g. cones, spiders and strombs, are covered in periostracum or coral growths - an extremely effective camouflage adapted to their habitat. Cowries have their glossy shells covered by a fleshy protective mantle. They are found mostly away from direct sunlight, although some, e.g. Calpurneus verrucosus, are found on their coelenterate hosts effectively camouflaged. Other reef dwellers such as star fish, sea hares, sea cucumbers of beche-de-mer, octopus and crabs are found fully exposed at low tide, or in sandy pools amongst the reef, where there are also many varieties of small colourful tropical fish. Bristle worms and flat worms are common in sandy patches and pools. Small clumps of dead coral scattered everywhere along the reef appear uninteresting at first, but they will generally reveal a teeming mass of marine fauna when turned over. In contrast to the dead brownish upper surface of the boulder, the under side in nearly every case will show an assemblage of colour. Bryozoans, egg masses of moluscs, sponges, algae, sea urchins, brittle stars and worms are a few of the life forms beneath these boulders. Such boulders must be turned back again. It is impossible to shell out a reef, as export figures confirm, but it is very easy to destroy a reef within a short time by not returning the coral heads to their original positions.

2. In contrast, the rubbly areas have few inhabitants. Fauna such as cones, strombs, ceriths, star fish, sea cucumbers, sea urchins, crabs, octopus and others are found. Octopus occupy a so-called nest in some convenient cavity it clears for itself in the surface of a coral bank. Such sites may have a low crater-like mouth with the margins comprised of small debris which often includes empty bivalves.

3. On the sand flats, periostracum free shells such as augers, cones, mitres, volutes and olives are found in characteristic marks and tracks left by the shells as they search for food. On my first visit to the Cay there was evidence of many sand shells, most common being the red and white Mitre mitre, which were all about two inches long. However, due to the dramatic changes in the geography of the Cay which could have affected both food and habitat, these shells were rare in January. At low tides, especially during the night tides, the beaches surrounding Michaelmas become alive with ghost crabs exhibiting white and purple nippers. Many small bristle worms approximately half an inch long are found in the sand, which consists of broken corals, shells and other materials.

During the last two to three years I have collected five Crown of Thorns starfish, Acanthaster planci. One of them on my first visit to Michaelmas in December. However I found none in January. A pair of banded sea shrimps, Stenopus hispidus, was found on my second visit,

A small Portuguese man-of-war was washed up on the Cay. Carried by the northern branch of the warm South Equatorial Current, these normally pelagic free floating blue colonies of coelenterates are swept up the Queensland coast, along the outer Barrier Reef. Strong south east winds drive them on to northern

beaches especially during summer.

Sea hares of Genus Aplysai have an elongated foot and a pair of lateral lobes, the parapodia, on the back. By separating these, the outline of the fragile internal shell can be seen, transparent and almost flat, with only a suggestion of a loose spiral. In nudibranches, the colourful sea slugs, there is no shell at all. When disturbed, sea hares and their relatives eject a purple fluid which rapidly colours the surrounding water, acting like a smoke screen against predators. Sea hares have two pairs of head appendages: a paid of cephalic tentacles and dorsally behind them another pair, known as rhinopore, which are highly sensory organs. A more or less triangular-shaped sea hare was found which exhibited the two pairs of head appendages, reduced parapodia, and a fairly deep-set shell. Two of this species were found joined together, the anterior end of one joined to the posterior of the other. It is known that these organisms are hermaphrodite, i.e. possessing both male and female organs, but these may only function if specimens are solitary in the breeding season.

Feeding habits are related to the habitats and the types of food eaten by the animals. Herbivores consist of: detritus feeders - those feeding on plant material sifted from the sand; filter feeders - those filtering microscopic plants and animals from the sea water; browsers - those rasping plant material off the

rocks. Carnivores consist of predators and scavengers.

The earliest molluscs are believed to have fed on fine organic particles gathered from the sea floor by means of a rasp-like structure called the radula, situated in the floor of the mouth. Variously modified, the radula is still an important feeding organ in most modern gastropods. Some, e.g. cones, volutes, murex and augers have their radula teeth reduced to one or three per row and specialised for killing prey. All cones produce venom in a long coiled secretory duct which opens into the proboscis and has a muscular venom storage sac at its inner end. The radula is greatly modified and consists of a series of hollow barbed shafts which are pushed, as required, into the proboscis cavity where they are bathed in venom. The proboscis itself is very elastic and can be extended out of the mouth for a distance about equal to the shell length. It can "feel" around, and when its tip touches a victim, the shaft is thrust into the body and embedded there. Retraction of the proboscis then pulls the prey inward and the venom, a powerful neurotoxin, subdues it before it is swallowed whole. In some fish-eating species, the mantle and indeed the whole body of the cone can be expanded to swallow prey as much as twice the size of the cone. Murex shells drill holes in the shells of their prey by the joint action of a rotating radula and acid secretions from a gland in the floor of the mouth. Abalones and trochus shells have a simply structured radula consisting of a flexible chitinous strip bearing many transverse rows of cusps or teeth, which is rubbed over their food.

Nudibranches or naked gilled sea-slugs and flatworms relish the nematocyst-laden tissue in sea anemones. Remarkably, they do not suffer any ill effects from the stinging capsules, which they are able to transfer through their own digestive tracts to their tissues without discharging. The animals then knowingly use them for their own defence and food catching. Flatworms envelop their food by wrapping themselves around and excreting a mucus over the victim. A funnel-like pharynx is then extruded through the mouth on the under side of the body and the food is digested before it is swallowed.

In sea urchins and sand dollars, the mouth, which is on the under side, is surrounded by five strong teeth or jaws supported in a most complex apparatus known as Aristotle's Lantern. These herbivorous animals use these powerful jaws to scrape the algal film off the rocks.

Starfish pull open bivalves by working their hundreds of tube feet in relays to tire the shells' closing muscles. As the bivalve opens, the starfish extrudes its

stomach to envelop and digest the soft parts exposed.

Some beche-de-mer are plankton feeders, trapping the small organisms on tentacles around the mouth. Others swallow great quantities of sand from which they extract microscopic particles of food. Sea hares also do this and dissection reveals lengths of sand filled intestine.

Many symbiotic, predatory, and commensal relationships exist between the various fauna. A commensal or one-sided association is that of the anemone, Calliactis miriam, which attaches itself to the shells of hermit crabs, thus sharing the food and gaining a means of locomotion. The cowrie, Calpurnus verrocosus, is always found in association with the alcyonarian or false coral on the polyps of which it feeds. Pairs of the banded coral shrimp, Stenopus hispidus, are found in pools with their white antennae waving in the water to attract fish, which remain still while the shrimps pick at the parasites, injured tissue and fungal growths on their bodies and fins. Under natural conditions of territoriality, the ghost crabs with white nippers and those with purple nippers are fairly harmonious neighbours with each staying close to its burrow. However, when placed together in a bucket for a few hours, the white crab will leave the purple crab devoid of both legs and nippers.

The vegetation on Michaelmas Cay forms a covering about one and a half feet deep over part of the top of the Cay. Of the seven genera of plants, all are herbs, i.e. small, green and non-woody, and all are Halophytes, i.e. able to survive high salt concentrations in the surrounding sand. A general characteristic of the vegetation is the fleshy water-storing leaves and stems. To survive the harsh conditions, some plants are ephemeral annual or they have a thick water-storing tap root. In December-January three of the plant genera had all stages in the development of flowers, while two others showed no sign of reproduction. One of the two types of grasses had young plants in the vicinity with the seeds still attached to the fibrous root systems. A plant with a thick tap root was the most affected by the cyclonic winds and seas and a month later they were still being washed about by the tides. Also washed onto the Cay by the south east winds and currents were coconuts and numerous types of mangrove seeds, including Avicennia which I had not previously seen so far from the coast. Several mangrove seeds had germinated and died, while one had grown to 16 inches before dying. A coconut palm in the centre of the Cay had grown to a height of 3 feet before it died.

Various types of sea weeds I had not seen on the exposed reef were washed up on the Cay, with many small molluscs mixed up in it. An orange floating sponge of Phylum Porifora was also washed up. Other natural debris deposited along the high water mark at all times of the year includes cuttlefish shells, drift wood, pumice stone, dead coral and shells. The tides also bring rubbish from passing boats; boxes, shoes, light bulbs, bicycle tyres; while visitors leave the Cav untidy with bottles, tins and plastic containers.

An important ecological fact observed in January was the succession of blanket weed over the rocky outcrops on the eastern end facing Cairns - the first time I had seen blanket weed growing around Michaelmas. The weed had a rotten

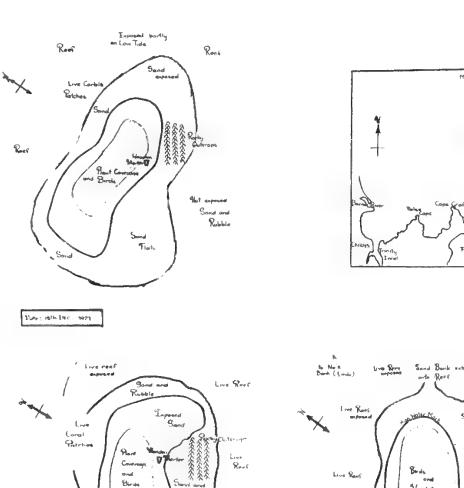
stench and could be pulled off the rocks in long strips.

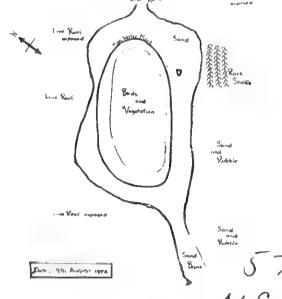
Always present at Michaelmas are the many thousands of birds: terns of several species, noddies, and the aggressive silver gulls which eat the eggs of the other birds when they fly off to fish. No eggs of the silver gull were noticed. Birds, nests and eggs were everywhere. The nests usually just a shallow depression, with a single egg. Territorial instinct in the breeding birds is very strong. All day and night birds fly around above the Cay, noisy the whole time.

Michaelmas Cay is under the protection of the "Fish and Oysters Acts, 1914 and 1945", which provide authority for the control and protection of fisheries, corals and other forms of marine life. However, bills should be extended to protect the Cay from littering and abuse by irresponsible visitors.

Conservation of the sea is not quite the problem it is on land. Populations of most marine animals are extremely resilient and recover quickly after disaster. The majority of reef life in shallow water lives also in deeper waters. Thus if a reef or sand cay becomes "fished out", it will probably be repopulated from deeper water if left for a few years, and provided it is free from pollution or other changes.

On the basis of this report alone, Michaelmas Cay and the surrounding reef stand as an area of much interest in every sense. Its intrinsic scientific and aesthetic values are important assets. Therefore I strongly stress that the area should not be subject to man-made alteration or interference without careful consideration of the ecological consequences which may result.





N811

G K Bolton Printers, Cairns

3 feets

Pale sell, Just 1978.



# THE

# NORTH QUEENSLAND NATURALIST

## CAIRNS

## Journal of

# NORTH QUEENSLAND NATURALISTS CLUB

Founder Presd, the late Dr. HUGO FLECKER.

OBJECTS-The furtherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

> ADDRESS - Box 991, P.O. CAIRNS. Q. 4870, Australia. Phone 53 1829.

MEETINGS-Second Tuesday of each month at Oddfellows Hall, Lake Street, p.m.

FIELD DAYS-Sunday before meeting. Notice of place and time given in "Cairns Post."

Subscriptions (Due September 30) :

City and Suburban Members, \$3.50

Country Members, \$3.00

Pensioner and Junior Members, \$1.00

Club Officers -

President:

W. Huddy, Esq.

Hon. Secretary: Mrs. M. L. Cassels

Hon. Treasurer: Mr. W. Felton

Editor:

Miss J. Mortis

Patron:

Mr. S. E. Stephens

Vol. 41

DECEMBER, 1973.

No. 162

## CONTENTS

| Notes   |     | ••• | 200   | *** | *** | :   | *** | *** | *** | 2   |
|---|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|
| Obituary  | *** | *** | • * • | ••• | *** | *** | *** | ••• | *** | 2   |
| Book Review                                       |     | *** | •••   | *** | ••• | *** | *** | *** | *** | 2   |
| Two Lizards                                       |     | ••• | •••   | *** | *** | *** | *** | *** | *** | 3   |
| An Early Naturalist in Queensland                 |     |     |       |     |     |     |     | ••• | *** | - 3 |
| The Effects of the 1951 Downpour at Simpson Point |     |     |       |     |     |     |     | *** |     | 5   |
| Birding to Mt. Isa and Back                       |     |     |       |     |     |     |     |     |     | 7   |

#### NOTES

The Club is forming a collection of photographic slides of mainly N. Q. natural history subjects for the interest and enjoyment of members and visitors. If you have any good slides which you could donate to the collection, please do.

Members are reminded that subscriptions are now due.

Also, please send more contributions for this Journal.

To all readers we extend the worn but ever-hopeful Season's Greetings.

#### **OBITUARY**

We regret to report the death of one of our very valued members, Mr. Kendall Collins. Ken was a member for many years and was most generous in his gifts to the Club. He was a keen geologist and had a wonderful collection of rocks, minerals, fossils and gemstones. He was always happy to help people: and to give them the benefit of his wide knowledge. He will be missed by all the members who will always remember his cheerfulness, humour and quiet kindliness.

M. L. C.

### **BOOK REVIEW**

Agony in the Pacific by L. G. Wilson, published by the author, whose address is: c/o Feez & Ruthning, Solicitors, G. P. O. Box 210, Brisbane, Q.

This book is a damning indictment of the abuse and exploitation suffered by the indigenous peoples and the wildlife of Australia and the Pacific region since Captain Cook mapped the Pacific for European whalers, sealers, traders and settlers to follow. A commercial, industrial, political motive for Cook's voyages is suggested in the competitive demand for vast quantities of oil in Britain and France through the Industrial Revolution period 1750-1850 ... Fossil oil was found in Pennsylvania in 1859. By the late 1700's, whales had been exterminated in the Mediterranean and were dwindling in the North and South Atlantic. Settlements on the Australian coast provided ports for whaling, and for the "great Bass Strait seal hunt" which, within thirty years, had almost totally destroyed the incredibly rich fur-seal colonies which Flinders reported there, and the local Aboriginal tribes who were brutally enslaved in this brutal trade. The author finds crudity and cruelty still characteristic of Australians today, with people and Government departments alike in their greed to exploit natural resources regardless of the havoc caused to the environment, and with an equal disregard for the rights of the Aboriginal people. However, I fear the bitterness expressed in this book will not greatly help the cause of Aboriginal land rights or of conservation.

#### TWO LIZARDS

In and around the Cloncurry district there is a remarkable small lizard, about four or five inches long. It is to be found on Gidyia trees, mostly on the main trunk of the tree. I have never found it on anything else. It is very dark coloured, matching the colour of the Gidyia bark. The most remarkable thing about these lizards is that, if you touch or annoy them, they do not attempt to bite you but they literally squirt a fine spray of sticky liquid from the various joints of their tail. Of course most of the local children call them "Squirt Lizards!" The various museums in the South have not been able to enlighten me about these lizards.

In and around the Hughenden and Richmond district there is a little ground lizard about five or six inches long. It is the colour of the earth about there, mostly light brown. If these harmless little lizards are disturbed they will run away for a couple of yards and then, almost without fail, they will shake or wave one of their little front legs. Some people call them "Little Round Heads" but most of the children call them "Ta-ta Lizards". I have never been able to find out what is the significance of this action after being flushed.

H. R. Thurston, Mareeba.

### AN EARLY NATURALIST IN QUEENSLAND

By G. P. Whitley.

John Musfelluray (1821-1867).

"One of the best naturalists that ever left the shores of the British Isles", said Gregory Mathews in his Birds of Australia, was John MacGillivray who was born at Aberdeen in 1821 and died in Sydney in 1867.

The son of a famous ornithologist, John knew how to shoot and dissect birds from the age of ten and was of an adventurous disposition. The Earl of Derby sent John as assistant naturalist aboard H. M. S. Fly which explored the Great Barrier Reef between 1842 and 1844. He collected thousands of specimens but seems to have left no journal of that voyage; however short papers in the Zoologist recall some of his experiences. On Raine Islet, where a beacon was erected, innumerable sea-birds were found, some new to science. In June 1844 alone, MacGillivray estimated the shore party had eaten 3,000 birds and 1,410 dozen eggs, besides turtles.

By 1846, MacGillivray had left Britain with T. H. Huxley in H. M. S. Rattlesnake and he wrote a book about the voyage abounding in interesting natural history observations. He spent ample time in what is now Queensland in 1848 – 49, but the expedition came to an end in Sydney next year.

His third voyage to Australia was in H. M. S. Herald, arriving in 1853 and is less known than the earlier ones. Unfortunately he did not write another book, but his notes are in the Admiralty, London. Evidently MacGillivray left the vessel before she went to the Swain Reefs and the Great Barrier Reef. In the mid-1850s he traded in the Pacific Islands, visiting remote places in search of sandalwood, beche-de-mer and gold, and he sold specimens to museums in Australia and Britain. Human skulls fetched two guineas apiece and the skins of fishes five shillings. The oldest fish specimen in the Australian Museum, Sydney, is a Surgeonfish which he collected in the New Hebrides in 1858. Times were dangerous in the South Seas: cannibalism and widow-strangling were practised in the New Hebrides when he was there and more than once he had to shoot men in self-defence. "When there is any fighting going I must always go in for my share", he wrote, and "little do the people at home know the fearful risks I have run to enrich the national collection with specimens. "MacGillivray had been a great friend of Ben Boyd and searched for his remains after his murder. Yet he was kind to his native employees who called him 'Bilbo Baccy' because of his gifts of tobacco to them. As a medical man, he treated their sicknesses, including cases of cone bite and fish poisoning in 1858.

He was a very great naturalist and collector with broad interests in zoology and botany, making many discoveries, but perhaps his particular interests were bats among the mammals, birds generally (for which John Gould was beholden to him), snakes, fishes, molluscs and insects, besides horticulture.

His last visit to Queensland was in 1860 in the Julia Percy, captained by William Banner, who was later to gain fame as a pioneer pearl-seeker in Torres Strait. MacGillivray was back at his old Rattlesnake haunt on Lizard Island and on the mainland in July 1860, at various places up to Albany Island (December 1860), then back to Lizard Island (where he slept in a grass hut on 235 consecutive nights) and down to Rockhampton. in December 1861.

He then applied for the job of Assistant Curator of the Australian Museum, Sydney, but Gerard Krefft was appointed, remarking some years later, "this gentleman would certainly have carried the day had not the Macleays hated him thoroughly because he was a clever man. I confess Mr. Macgillivray (with all his failings) was superior to myself...."

In 1862, MacGillivray met Dr. J. C. Cox in Sydney and helped him greatly with his Catalogue of Specimens of the Australian Land Shells.

In 1864 MacGillivray settled at Grafton, New South Wales, and died in Sydney of coronary disease in 1867. Mr. G. P. Whitley

C/- The Australian Museum PO Box A 285

SYDNEY SOUTH NSW 2000

# THE EFFECTS OF THE 1951 DOWNPOUR AT SIMPSON POINT

By E.C.F. Bird

Geomorphologists study landforms. They seek to explain the evolution of the land surface, and to relate the changes taking place to processes of erosion and deposition. Some landforms (especially on coasts) have developed rapidly and are still changing at rates that can be measured by repeated surveying; others have evolved slowly over long period of geological time - millions of years - and may be changing little, if at all, under present conditions. It is often difficult for a geomorphologist to decide whether a particular landform - a valley, or a hill-side slope - has been shaped gradually by the slow but cumulative effect of ordinary processes, or whether it owes its salient features to rare catastrophic events, such as an earthquake, a storm surge, or a heavy downpour of rain.

In the Cairns district, ordinary processes include the rumoff of water resulting from an annual average rainfall between 70 and 90 inches on the coastal lowlands, rising to over 100 inches up on the ranges. Much of this rainfall comes in the wet season, from December to March or April, but there is considerable variation from year to year. Rainfall data from Cairns airport for the decade 1961-70 (obtained for me by Mr. Robert Brown) show a maximum of 102. 84 inches in 1964, a minimum of 36.50 inches in 1966, and an annual average of 74. 79 inches. Actual incidence of rainfall is more important in generating rumoff than yearly totals, especially in the tropics, where much of the rain comes in occasional heavy downpours. Rain fell at Cairns on an average 148. 3 days a year during this decade, and news-worthy registrations of more than an inch in a day occurred, on average, 19 times a year. The wettest day was 12th March 1967, with 1586 points, and the second wettest 4th February 1967, when 1127 points fell—so that two wet days produced 27. 13 inches, nearly one third of the 1967 total rainfall of 92. 48 inches.

Such downpours lead to widespread runoff and extensive flooding, and may accomplish more erosion and deposition in a few hours than is achieved by ordinary processes over many years. Often the effects of a single storm may be visible many years later.

The steep slopes of hillsides in the Cairns district are marked by gulleys, down which there is stream flow after rain, and towards their base is an apron of deposited material - typically with boulders and stones in a matrix of red or yellow silty clay. Asked to explain the features of these slopes, a geomorphologist would have to consider three possibilities:

1, that there is a gradual movement of weathered material down slope under ordinary conditions, so that slope-foot aprons are being slowly built up;

2, that the movement of material down the slopes occurs only during

occasional episodes of very heavy rainfall; or

3, that the slopes and the aprons developed under different conditions in the geological past, and are now simply relict features, no longer being shaped by present processes.

North of Buchan Point (15 miles up the Captain Cook Highway from Cairns) one sector of hillside slope; the north-east flank of Macalister Range, descends steeply to the coast, past Ellis Beach to Simpson Point and Redcliff Point. The basal apron of rocky debris in an earthy matrix has been cut back by the sea and incised by streams to expose sections at a number of points, and road-side cuttings also show this heterogeneous, poorly sorted material, structureless except for faint layering suggestive of successive episodes of deposition.

In the wet season the numerous creeks that flow down this slope carry water swiftly to the sea, and sediment, including gravel, moves down the watercourses. After rain has fallen, the outflowing streams extensively discolour the adjacent sea with brown, muddy water. Tunnels and conduits allow the streams to pass under or over the Highway, and piles of gravel accumulate near these after wet weather. However, under ordinary conditions, changes occur only along the watercourses: on the intervening slopes runoff is brief and down-slope movement limited. In 1968, paint was applied to four square-metre quadrats on the hillside above Simpson Point, and these were inspected for evidence of down-slope movement during the next four years. No major downpour occured during this period, and the surface remained almost intact. Similar painted quadrats in the watercourses disappeared during each wet season. Slope-foot deposition occured only near the mouths of the creeks.

This is in sharp contrast with the changes that occurred during a single torrential downpour on the afternoon of Friday 12th January 1951. Details of this downpour and its consequences have been obtained from reports in the Cairns Post, the Townsville Daily Bulletin, and the Brisbane Telegraph on the following Monday (15th January), from a report prepared by Mr. R. D. Gallop for the Department of Main Roads, and from local information assembled by Mr. R. Brown.

Between 25 and 30 inches of rain fell at Buchan Point in just under five hours, 8 inches falling in one hour at the height of the storm. On the slopes of Macalister Range the rainfall was probably even higher, and vast quantities of water cascaded down the slopes. As the downpour proceeded, thousands of tons of rocky and earthy debris flowed and slid down across the Captain Cook Highway and into the sea. Trees were uprooted, and boulders up to 10 feet high strewn over the slope-foot apron and on to the rocky shore. Water rushing down the creeks carved out ravines, entrenched stream beds, swept away culverts, and carried rubble and earth into the sea.

When the storm had subsided it was found that the hillside was scarred with landslips, the largest of which was 240 feet long, in front of a scar 50 to 70 feet high. Boulders, rubble and earth lay in heaps and ridges up to 10 feet high at the base of the slope, and the beaches and rocky shores were covered with debris. A six mile stretch of the Highway was breached in several places, notably near watercourses. The bitumen had been undermined and moved away in large slabs, and on some sectors the roadway was buried by rubble. Much of this was subseququently removed, but near Simpson Point it was found more practical to rebuild the road at a higher level on top of the rubble. The partly-buried old road can still be seen below it on the seaward side.

Twenty years later the writer examined this area, locating features with the aid of the photographs and measurements that accompany Mr. Gallop's report. Vegetation has largely recovered, but the 1951 landslip scars and debris flows can still be traced near Simpson Point. The internal structure of the 1951 deposits is very similar to that of the slope-foot apron, indicating that the earlier slope-foot deposits were probably the outcome of earlier such downpours. There is no record of any other rainfall on this scale in the Buchan Point area since Cairns was first settled in 1876, but the 1951 downpour could well have been 'the storm of a century' the kind of event that occurs only rarely in the Cairns district. Nevertheless, it changed the form of the slope, and added fresh material to the slope-foot apron.

A geomorphologist would therefore reject the first of the three possibilities mentioned above, and prefer the second, relating downslope movements to occasional episodes of very heavy rainfall. The third may also be ruled out, since an occasional heavy downpour is still capable of re-shaping the hillside slopes It is, however, possible that such downpours occurred more frequently in the past, permitting slope evolution to proceed more rapidly than it does now. This is a problem for further research – in the meantime it will be interesting to await the next heavy downpour in the Cairns district and see what kinds of landform change result.

Reference: E. C. F. Bird 1970 The steep coast of Macalister Range,

Journal of Tropical Geography, 31, 33-39.

#### BIRDING TO MT. ISA AND BACK

During the 1972 Christmas holidays my wife and I had the opportunity to make a trip to Mount Isa. Although we knew that it would be very hot out there, we were keen to see new birds and decided to give it a go. After all, in an area totally different from Cairns and its surrounding districts and approximately 600 miles distant, it was reasonable to expect to find many new birds that could not be seen at home. During the eleven days spent on the journey to Mount Isa and back, we recorded about 120 birds, all but ten of which we had seen before.

It would be tedious to mention all those we saw so I shall list mainly the ones that were new to us. Leaving Cairns at 4,00 a.m. the Thursday before Christmas, we moved smartly along through Mount Garnet to Normanton and reached there about 3,30 that afternoon. Travelling at that speed did not permit much bird watching but camping at the Norman River that night gave us an opportunity to look around. Here the Little Friar Bird was much in evidence and our first new bird, a Pied Heron, was spotted – first a lone bird and later a flock of a dozen. Back from the river a bit were parrots galore feeding in the flowering eucalypts, mainly Varied and Rainbow Lorikeets, the former being another new one to us. The adult is a handsome bird with his brilliant red cap and is easily identified by the prominent white ring around the eye and the rather short tail. Next day we sped to Quamby (with not so much as one house in over 200 miles but sealed road all the way), then down to Cloncurry and out to Mount Isa.

The country was badly in need of rain with temperatures very high and millions of flies. Birding was possible early in the morning, but throughout the rest of the day, bird movement (and our own) was very restricted. New birds seen here included: Spotted Bower Bird, sitting quietly in the shade, mouth open and panting with the heat; Plumed Pigeon, a pretty little bird whose camouflage enabled him to disappear completely from view in dusty rocky surroundings; Cloncurry Parrot, whose plumage was noticeable to me because of the complete absence of red in it; Silver Crowned Friar Bird, and Little Corella.

Homeward bound we could afford to take a more leisurely pace, leaving Mount Isa late in the afternoon to avoid the heat, and camping by the road side about 70 miles south of Normanton. It is a delightful sensation to camp in the open, miles from anywhere, with absolute quiet and the stars shining brilliantly overhead - a welcome change from smog and traffic noise, barking dogs, blaring T. V., etc. we get at home.

The most rewarding part of the trip was when we started off next morning and for the next two hours. We saw a couple of finches, thought at first to be Black Throated but they proved to be Pictorellas (another new one); also one of the prettiest wood swallows I have yet seen, the Masked. Closer to Normanton was low lying country that had had good rain and was in prime condition with new grass between one and two feet high. This was literally alive with birds. Pratincoles which I had seen only once before, were along the road in hundreds. There were flocks of Glossy Ibis, Little Corellas, Galahs, Bush Larks, White Necked Herons, with some White Headed Stilts, a few Brolgas, Grey Teal, Royal Spoonbills, a lone Jabiru and, further on, some Bustards and Emus. Not far from Normanton we saw six Sarus Cranes.

The rest of the trip was uneventful and we then went through Mareeba to our old stamping ground, Station Creek near Mount Carbine. For many years we have been camping here at odd times, and only now we recorded a new bird for this area, the Common Bronzewing Pigeon.

To conclude - we must have missed seeing many new birds because of the heat so I imagine the best time to visit there would be during the cooler months of the year. Our route took us over bitumen road all the way (770 miles) with the exception of 140 miles between the Gilbert River and Normanton. This was dirt road but nevertheless permitted speeds of 50 m. p. h. It could be a hazard in wet weather.

Items which are essential on this trip are a vehicle in good mechanical condition, five good tyres (not retreads) plenty of water plus a water bag and of course ample petrol. Fruit like water melon and grapes are well worth carrying.

Marion and I are enthusiastic about returning to the area 70 miles south of Normanton for we feel sure there must be quite a few more different species there yet to be seen.

Jack Cassels.

#### ROBBERS

While I was cooking in a mustering camp at Saxby Downs Station, two butcher birds came every day to be fed. I placed small pieces of meat on a log for them, and they would carry it up to the branches of the nearby gidyea trees. Then their trouble began. Their nest was a quarter of a mile away. As soon as one of them flew off with a piece for their babies, the crows darted down so close that Butch dropped the beef and a crow would have it before it hit the ground. Occasionally one of the crows took a hurried flutter into our camp to try to take the meat from the gidyea trees, but then I would get the . 22 to work and shoot a crow if possible. If I happened to knock one they would keep clear for the rest of the day. Butch and his better half did not mind a shot being fired.

Following the butcher birds once, I located their nest. I intended putting meat on a log near thier home, but no, they would not come while I was near the nest, yet, if I carried a few buckets of water morning or evening before feeding them, they flew within a few feet of me continuously, uttering their friendly call, until I fed them.

The late Stanley H. Boyd

Each author is responsible for the opinions and facts expressed in his or her article.





\* . 

